



109

O.R.

DISCARD



Presented to
The Library
of the
University of Toronto
by
The Ontario Research
Foundation

JOURNAL
OF THE
American Veterinary Medical
Association

FORMERLY
AMERICAN VETERINARY REVIEW

Original Official Organ U. S. Vet. Med. Ass'n.

Edited and Published for

THE AMERICAN VETERINARY MEDICAL ASSOCIATION

By

H. PRESTON HOSKINS, DETROIT, MICH.

EXECUTIVE BOARD

George Hilton, 1st District; T. E. Munce, 2d District; D. S. White, 3d District; J. A. Kiernan
4th District; C. E. Cotton, 5th District; B. W. Conrad, 6th District; Cassius
Way, Member at Large

SUB-COMMITTEE ON JOURNAL

D. S. White

J. A. Kiernan

Volume LXIV

NEW SERIES VOLUME 17

October, 1923 to March, 1924

DETROIT, MICH.

1924



SF

601

A5

164

cop 2

657336

LG 4-57

LIST OF ILLUSTRATIONS

GROUP PICTURE, MONTREAL MEETING, 4.

CARTOON, MONTREAL MEETING, 6.

PORTRAIT OF DR. W. H. WELCH, 8.

BOOTH OF CHAMPAIGN COUNTY (ILLINOIS) VETERINARIANS, 92.

AN OUTBREAK OF COW-POX, INTRODUCED BY VACCINATION, INVOLVING A HERD OF CATTLE AND A FAMILY, 93.

Fig. 1. Pox lesions on the teats, 93.

Fig. 2. Pox lesions on the face of Mrs. M., 95.

JIMSON WEED POISONING, 98.

Jimson Weed, 98.

A RADICAL OPERATION FOR NASAL SARCOMA IN A MULE, 99.

Nasal Sarcoma, 101.

PHOTOGRAPH, NORTH CAROLINA STATE VETERINARY MEDICAL ASSOCIATION, 114.

PORTRAIT OF DR. CHARLES H. STANGE, 141.

URINARY CALCULI IN SHEEP, 221.

Fig. 1. Bladder and urethra opened to show calculi, 222.

Fig. 2. Bladder showing two large blood-clots, 223.

NOTES ON THE TREATMENT OF FOXES WITH CARBON TETRACHLORIDE AND THE USE OF SOFT ELASTIC GLOBULES FOR PREVENTING INHALATION-COLLAPSE, 318.

Fig. 1. The first step in restraint, 322.

Fig. 2. The operator takes a secure hold, 322.

Fig. 3. The tongs are released, 323.

Fig. 4. The operator tilts the head, 324.

Fig. 5. The fox snaps its jaws together, 325.

Fig. 6. The operator holds the ears, 326.

Fig. 7. When two assistants are available, 326.

CHRONIC CARRIERS IN FOWL TYPHOID, 329.

Fig. 1. A mottled Ancona hen affected with fowl typhoid, 330.

DOUBLE INTRADERMIC TUBERCULIN INJECTION, 346.

Fig. 1. Fourteen-year-old cow showing a double reaction, 346.

AN UNUSUAL CASE OF RABIES, 349.

BIG ONES THIS TIME, 350.

Fig. 1. *Echinorhynchus gigas*, 350.

PORTRAIT OF MISS ANN LORRAINE BLATTENBERG, 364.

SNAP-SHOT TAKEN AT MONTREAL, 365.

ANESTHESIA, GENERAL AND LOCAL, 413.

Fig. 1. Operative field blocked by intracutaneous injection, 420.

Fig. 2. Operation in progress within the area, 421.

Fig. 3. Completing the operation, 422.

Fig. 4. Part of branch of lower jaw of horse; medial view, 422.

Fig. 5. Course and position of needle, 423.

Fig. 6. Depth to which needle must penetrate, 424.

Fig. 7. Lateral view showing position of needles for blocking nerves, 425.

Fig. 8. Approximate course, relation and direction of needle, 425.

Fig. 9. Field of operation and method of injection, 427.

INJECTION OF CATTLE WITH *B. tuberculosis* (AVIAN) AND RESULTS OF SUBSEQUENT TUBERCULIN TESTS, 440.

Fig. 1. Ten head of steers used in the experiment, 441.

Fig. 2. Lesions found in hen no. 11, 444.

INDOLENT ULCER OF GLANS PENIS SUCCESSFULLY TREATED BY ELECTROCOAGULATION, 475.

Fig. 1. The subject of the operation, 475.

DICEPHALUS BISPINALIS TRICHIRUS, 485.

Fig. 1. X-Ray plate of case, 486.

SURGERY OF THE CERVIX, 576.

Fig. 1. Laceration of lips of cervix uteri, 577.

Fig. 2. Circular amputation of cervix uteri, 582.

Fig. 3. Special instruments for trachelectomy, 583.

Fig. 4. Circular amputation of cervix uteri, 584.

Fig. 5. Circular amputation of cervix uteri, 585.

Fig. 6. Circular amputation of cervix uteri, 586.

Fig. 7. Circular amputation of cervix uteri, 588.

FLUKES OF THE GENUS COLLYRICLUM AS PARASITES OF TURKEYS AND CHICKENS, 591.

Fig. 1. A six-weeks-old turkey poult, 592.

Fig. 2. Necrosed areas, 593.

Fig. 3. Cysts of Collyriclum on leg of six-weeks-old turkey poult, 594.

SWINE DYSENTERY, 600.

- Fig. 1. Young hog showing physical symptoms of dysentery, 602.
- Fig. 2. Mucosa of colon showing diphtheritic plaques and membrane, 603.
- Fig. 3. Mucous membrane and submucosa of colon, showing exudate, etc., 604.
- Fig. 4. Same, showing diphtheritic membrane and necrosis, etc., 605.
- Fig. 5. *Balantidium coli* in crypt of mucosa, 606.
- Fig. 6. Comma-shaped micro-organisms in section of colon, 608.
- Fig. 7. Micro-organisms in section of colon, 609.

A STUDY OF RABIES FROM THE STANDPOINT OF ETIOLOGY, 678.

- Fig. 1. Preparation from hippocampus major of rabbit V-3, 682.
- Fig. 2. Preparation from cerebellum of rabbit V-3, 682.
- Fig. 3. Preparation from hippocampus major of rabbit D-3, 683.
- Fig. 4. Preparation from the cerebellum of rabbit V-3, 684.
- Fig. 5. Preparation from the hippocampus major of rabbit D-3, 685.
- Fig. 6. Preparation from the hippocampus of rabbit F-3, 685.

UMBILICAL HERNIA IN THE PIG, 705.

- Fig. 1. Umbilical hernia in the male pig, 708.
- Fig. 2. U-shaped incision isolating the penis and prepuce, 709.
- Fig. 3. Prepuce reflected. Peritoneal sac isolated, etc., 710.
- Fig. 4. Mattress sutures being placed in peritoneal sac, 711.
- Fig. 5. Showing continuous suture placed in the fascia, etc., 712.
- Fig. 6. Showing second line of suture tightened and tied, 713.
- Fig. 7. Showing continuous suture in the skin, 714.
- Fig. 8. Showing final dressing of the wound, 715.

PHOTOGRAPHS, WISCONSIN SHORT COURSE FOR VETERINARIANS, 773, 775.

INDEX OF AUTHORS

- Aghion, J. E., 99.
 Atherton, I. K., 278.
 Baker, D. D., 231.
 Barnes, M. F., 83.
 Barton, Prof. H., 299.
 Beaudette, F. R., 225.
 Bemis, H. E., 413.
 Benner, J. W., 457.
 Boerner, Fred, Jr., 93.
 Boughton, I. B., 723.
 Cahill, Edw. A., 171.
 Carpenter, C. M., 37.
 Conklin, R. L., 299.
 Cotton, W. E., 479.
 Covault, C. H., 413.
 Crawford, A. B., 228.
 Danforth, A. L., 334.
 Dearstyne, R. S., 329, 623.
 Dimock, W. W., 288.
 Eckles, C. H., 716.
 Edwards, T. H., 697.
 Eichhorn, A., 690.
 Elder, Cecil, 440.
 Faber, G. G., 350.
 Fetter, Geo. E., 628.
 Fitch, C. P., 716.
 Fuller, J. W., 619.
 Gieskemeyer, Harry, 611.
 Giltner, Ward, 469.
 Golden, G. E., 346.
 Graham, Robert, 723.
 Guard, W. F., 413, 705.
 Hanson, Karl B., 210, 318.
 Hardenbergh, John G., 193.
 Hart, G. H., 37.
 Hastings, C. C., 728.
 Hess, Roy F., 349.
 Jorgensen, C. E., 699.
 Kaupp, B. F., 329, 623.
 Kelser, R. A., 678.
 Kernkamp, H. C. H., 591.
 King, E. D., Jr., 98.
 Kinsley, A. T., 184.
 Klein, Louis A., 216.
 Lee, A. M., 440.
 Lockhart, Ashe, 451.
 Lyon, B. M., 348, 690.
 Marsh, Hadleigh, 304.
 Mydland, G. H., 204.
 Palmer, C. C., 475.
 Parker, J. W., 451.
 Parker, R. H., 732.
 Polk, T. P., 342.
 Quitman, E. L., 62.
 Ray, J. D., 451.
 Redfield, Knowlton, 485.
 Reichel, John, 616.
 Schofield, Frank W., 553.
 Schroeder, E. C., 479, 544.
 Scott, H. P., 221.
 Scott, Joseph P., 67.
 Seal, J. L., 716.
 Skidmore, L. V., 629.
 Smith, H. C., 630.
 Snyder, Ethel, 288.
 Spaulding, R. H., 338.
 Steel, E. R., 26.
 Turner, John P., 75.
 Van Volkenberg, H. L., 210, 318.
 Watson, E. A., 146.
 Wegner, E. E., 738.
 Welch, W. H., 9.
 Whiting, R. A., 600.
 Wileden, L. A., 737.
 Williams, W. L., 154.
 Williams, W. W., 576.

INDEX OF SUBJECTS

Abstracts:

Actinomycosis, The Causal Organisms of Bovine, 351.
 Detection of Worm Eggs in Feces of Animals, and Some Experiments in the Treatment of Parasitic Gastritis in Cattle, The, 103.
 Disinfection of Sperm in Mammals, Especially in Relation to Dourine in Horses, Experiments on the, 104.
 Dysentery in Lambs, Bacillary, 235.
 Immunity Towards Disease of the Bovine Placenta Due to *Bacillus Abortus* (Infectious Abortion), Studies in Vaccinal, 635.
 Lymphadenitis and Pneumonia of Sheep, A Diplococcus Associated with Caseous, 353.
 Melitensis-Abortus Group of Bacterial Organisms, The Nomenclature of the, 633.
 Nematode Parasites from Zanzibar, A Collection of, 235.
 Nematodes from the Domestic Rabbit, A New Genus of, 744.
 Ophthalmia of Cattle, An Infectious, 234.
 Pneumonia in Sheep, Bacteriologic Study of, 352.
 Pneumonie Beim Fohlen, Spezifische Infektiöse. Ein Neuer Eitererreger Beim Pferde. (Specific Infectious Pneumonia of Foals. A New Pyogen in the Horse), 489.
Sarcocystis Tenella, Some Points Relating to the Morphology and Development of, 235.
 Speciation and Host Relationships of Parasites, 742.
 Studies on the Production of Antitoxic Sera, 745.
 Trematode Parasites of British Birds, A Reference List of the, 744.
 Trematode Parasites of British Mammals, A Reference List of the, 744.
 Trypanosomes of Africa, and the Means by which They are Spread in Nature. Further Inquiries into the Zoological Status of the Polymorphic Mammalian, 743.
 Ulcer of the Stomach in Domestic Animals, Etiology of Spontaneous, 103.
 Time Required for Food to Pass through the Intestinal Tract of Fowls, 745.

Army Veterinary Service:

Appointment and Promotion Policy for Medical Department Reserves, New, 525.
 Army Medical Center Established at Washington, D. C., 317.
 Surgeon General, Report of the, 784.

Association News:

American Veterinary Medical Association
 Election, Executive Board, 411, 575, 677.
 Lost, 373.
 Montreal, Ten ex-Presidents at, 128.
 Montreal, At, 215.
 Montreal Meeting, Sidelights on the, 255.
 Notes, Convention, 192.
 Organization of the A. V. M. A. 1923-24, 655, 789.
Proceedings of the Sixtieth Annual Meeting.
 Address of Welcome, 105.
 Amendments, 641, 643, 645.
 Dalrymple, W. H., 493.
 Election of Officers, 354.
 Honorary Members, 651.
 Legislation, 239.
 MacEachran, D., 492.
 Medals, 651.
 Meeting Place for 1924, Selection of, 361.
 Members, New, 241, 640.
 Relief Fund, 236.
 Reports:
 Abortion, Committee on, 646.
 Anatomical Nomenclature, Committee on, 251.

American Research Council Committee, 491,
 Audit Committee, 653.
 Budget Committee, 653.
 Executive Board, 236.
 History, Committee on, 251.
 Horse Association of America, 649.
 Intelligence and Education, Committee on, 649.
 Legislation, Committee on, 493,
 Policy, Committee on, 366, 636.
 Prevention and Control of Transmissible Diseases of Animals, Committee on, 649,
 Resolutions, Committee on, 652.
 Revision of Constitution and By-Laws, Committee on, 493, 639, 642.
 Secretary-Editor, 250.
 Treasurer, 250.
 Tuberculosis, International Committee on, 643.
 Resignations, 640.
 Royal College of Veterinary Surgeons, War Memorial Library, 236.
 Royal (Dick) Veterinary College, Centenary Anniversary, 240.
 Wray, W. H., 491.
Women's Auxiliary
 Loan Fund, 364, 491, 659, 786

Other Meetings:

Alabama Short Course for Graduate Veterinarians, 778.
 B. A. I. Veterinarians, Mississippi Valley Division, National Association of, 662, 777.
 B. A. I. Veterinarians, Illinois Division, National Association of, 780.
 British Columbia Veterinary Association, 380.
 California Veterinary Practitioners' Week, 439, 746.
 Capitol Veterinary Medical Association, 776.
 Central Canada Veterinary Association, 664.
 Central Michigan Veterinary Medical Society, 519.
 Central New York Veterinary Medical Association, 513.
 Colorado Veterinary Medical Association, 768.
 Cornell University, Sixteenth Annual Conference for Veterinarians at, 755.
 Delaware Veterinary Medical Association, 124, 663.
 Dixie Veterinary Medical Association, 263.
 Eastern Iowa Veterinary Association, 381.
 Georgia State Veterinary Association, 256.
 Iowa State College Conference for Veterinarians 762.
 Iowa Veterinary Association, 760.
 Kansas Veterinary Medical Association and Conference of Kansas Veterinarians, 474, 782.
 Kentucky Veterinary Medical Association, 780.
 Mahoning Valley Veterinary Club, 767.
 Maine Veterinary Medical Association, 751.
 Manitoba, Veterinary Association of, 783.
 Maryland Veterinary Medical Association, 119.
 Massachusetts Veterinary Medical Association, 112.
 Michigan Agricultural College Veterinary Short Course, 481, 769.
 Michigan-Ohio Veterinary Association, 384.
 Minnesota State Veterinary Medical Association, 764.
 Mississippi State Veterinary Medical Association, 382.
 Nebraska State Veterinary Medical Association, 660.
 Nevada State Veterinary Association, 512.
 New Jersey, Veterinary Medical Association of, 752.
 New York City, Veterinary Medical Association of, 378, 508.

New York State Veterinary Medical Society, 121.
 North Carolina State Veterinary Medical Association, 113.
 North Central Iowa Veterinary Association, 511.
 Oklahoma State Veterinary Medical Association, 766.
 Pennsylvania Veterinary Conference, University of, 220, 749.
 Prophylactic Club of America, 382.
 Southeastern Michigan Veterinary Medical Association, 261.
 Southeastern States Veterinary Medical Association, 145, 385.
 Southwestern Michigan Veterinary Medical Association, 515.
 United States Live Stock Sanitary Association, 516.
 Virginia State Veterinary Medical Association, 757.
 Washington State College Post-Graduate School for Veterinarians, 760.
 Western New York Veterinary Medical Association, 521.
 Western Pennsylvania Veterinary Club, 481.
 Wisconsin Short Course for Veterinarians, 772.
 World's Dairy Congress, The Recent, 374.

Births..... 133, 270, 404, 535, 668, 796

Book Reviews:

Age of the Horse, The, 741.
 Entomology, Medical and Veterinary, 632.
 Diagnosis and Treatment of Internal Parasites, 102.
 Diseases in Captive Wild Mammals and Birds, 741.
 Live Stock Sanitation, 488.
 Maladies du Cheval, Les. (Diseases of the Horse), 351.
 Maladies du Mouton, Les. (Diseases of Sheep), 488.
 Manual of Determinative Bacteriology, Bergey's 233.
 Medecine et Chirurgie Canines (Canine Medicine and Surgery), 632.
 Traite de Therapeutique Chirurgicale des Animaux Domestiques (Treatise of the Surgical Therapeutics of Domestic Animals), 351.

Clinical and Case Reports:

Big Ones This Time, 350.
 Coccidiosis of Sheep, Intestinal, 629.
 Cow, An Uncommon Case Report in a, 737.
 Dicephalus Bispinalis Trichirus, 485.
 Petchial Fever, 349.
 Poisoning, Jimson Weed, 98.
 Polyarthritis and Rachitis in Calves, 231.
 Poultry Practice Pay? Does, 630.
 Purpura Hemorrhagica (Petchial Fever), 628.
 Rabies, An Unusual Case of, 348.
 Sarcoma in a Mule, A Radical Operation for Nasal, 99.
 Sound on the Bull, Passing the, 738.

Commencements..... 523

Communications:

B. A. I. History to be Published, 666.
 Brazil, A Veterinarian in, 401.
 Danger Ahead, 528.
 Mal de Caderas, 126.
 Milk Curdled, 127.
 St. Kitts, From a Member in, 527.
 Stomach Worms in Sheep, Iodine for, 528.

Editorials:

Address? Have We Your Correct, 273.
 Advertisers, Patronize Our, 137.
 Courtesy, Just A, 676.
 Danger Ahead, 274.

Des Moines, Plans for, 408.
 Directory in Press, 543.
 Dividends, It Pays Big, 410.
 Features in This Issue, 275.
 It Works Both Ways, 542.
 Legislative Committee, Help Our, 675.
 Legislative Program, A, 540.
 Meeting, A Memorabile, 2.
 Meetings, The Winter, 674.
 Montreal, Social Features at, 138.
 Names, More New, 144.
 President, Our New, 140.
 Publicity, More Fine, 673.
 Response, A Splendid, 1.
 So It Goes, 676.
 Student Enrollment for 1923-24, 143.
 Tempest in a Teapot, A, 409.
 Who Can Tell? 539.
 Year Has Passed, A, 407.

Engagements..... 132

Examinations, State Board 255

Marriages..... 132, 270, 403, 535, 668, 796

Meetings, Coming Veterinary, 7, 145, 276, 411, 543, 677.

Miscellaneous:

Ability Recognized, 128.
 Abortion, Bibliography on Bovine Infectious, 398.
 Accredited Herd, Advertising an, 220.
 Action, Drastic, 740.
 Airedales Hold Their Own, 510.
 Ancient Vet., Ye, 696.
 Animal, A Composite, 599.
 Announcements, 25, 677.
 Appointments, The President's, 575.
 B. A. I. History to be Published, 510.
 Blackleg and Its Prevention, New Bulletin on, 303.
 Boynton to California, Dr., 736.
 Calves, Test the, 487.
 Carriers, Swamp Fever, 125.
 Compliment, A Fine, 615.
 Correction, A, 698.
 Colors in Dogs, 704.
 Cow, For Prolapsed Vagina in, 529.
 Cow, Try This on the, 36.
 Damman in a New Position, Dr., 255.
 Dinsmore Uses Radio, Secretary, 590.
 Exhibit, Another Veterinary, 203.
 Feeding, Handbook on, 689.
 Fox Industry Growing, 599.
 Fully Deserved, 522.
 Guide, A Handy, 507.
 Here and There, 622.
 Hollingworth Puts Utica on the Map, Dr., 785.
 Horse, Regular War, 510.
 Horse, A Wonderful Tribute to the, 276.
 Horses and Farm Power, 727.
 Horse and Mules Sold, More, 333.
 Idea, A Fine, 92.
 John's Disease, Watch Out for, 468.
 Legislation Affecting Veterinarians—Year 1923, 391.
 Lesions, Unusual, 345.
 Live Stock Values on Decline, Farm, 627.
 Meat and Milk Inspection to be Featured, 481.
 Meeting for Ohio, Big, 402.
 Mule Production Shows Increase, 61.
 Observations, Scientific, 232.
 Opportunity, A Golden, 232.
 Pennsylvania, Veterinary Extension at the University of, 482.
 Pit-Mor-Ian, The, 522.
 Practitioners, Prizes for, 456.
 Publications Available, 170.
 Purebreds, Pledges to Use, 615.
 Reindeer Meat, Frozen, 740.
 Remembering, Worth, 599.

- Sheep Particularly Subject to Parasites, 524.
 State Live Stock Sanitary Officials, 389.
 Students, For Prospective Veterinary, 345.
 Swine Diseases, Bulletin on, 224.
 Theiler Kept Busy, Sir Arnold, 530.
 Thermometer Conference, Clinical, 797.
 Tick Eradication Progresses, 590.
 Tuberculosis, A Rare Case of, 203.
 Tuberculosis Eradication, Progress in, 209.
 Tuberculosis Eradication, Nearly Five Million Cattle Under Supervision in, 341.
 Tuck Visits Edinburgh, Dr., 786.
 Veterinarians Transferred, Bureau, 183.
 Veterinarians, to Represent, 704.
 Visitors at the Journal Office, 627.
- Necrology:**
- Bardes, Otto C., 403.
 Barnes, N. M., 795.
 Blackwell, John E., 793.
 Buck, Albert, 667.
 Collins, Robert E., 268.
 Commins, Frederick E., 269.
 Dallimore, George A., 790.
 Dixon, C. Price, 268.
 DuBois, George Byron, 790.
 Dunphy, George W., 531.
 Dunphy, Percy, 792.
 Fry, Curtis Lozelle, 534.
 Furbush, C. Lincoln, 267.
 Gilbert, Page L., 403.
 Gilyard, Mrs. A. T., 129.
 Goodman, Benjamin M., 795.
 Hart, James, 794.
 Hart, Sr., Leonard G. W., 269.
 Haskin, E. Blaine, 794.
 Hedley, Mrs. Clarke, 268.
 Henderson, Edwin P., 792.
 Hirtleman, Mrs. A. L., 534.
 Hunt, Frank, 267.
 Kinnell, George Noble, 790.
 Kirchner, William F., 266.
 Lamb, Morgan Baxter, 533.
 Ludington, Ira B., 132.
 Magley, Lloyd K., 266.
 Michener, J. Curtis, 131.
 Mueller, Ferd A., 130.
 Newhard, Irwin C., 268.
 Nighbert, James David, 793.
 Renner, H. M., 795.
 Saigen, Edward M., 533.
 Schauler, Charles A., 791.
 Schmidt, I. L., 667.
 Sevenster, John, 267.
 Sisley, M. J., 132.
 Southworth, Irving D., 269.
 Stephenson, William A., 129.
 Thomsen, John, 668.
 Ward, H. E., 269.
 Watkins, Howard J., 668.
 Wende, Horatio S., 534.
 Wilson, Fred A., 668.
 Wray, W. H., 130.
- Papers:**
- Abortion of Cattle, The A. V. M. A. and Infectious, 469.
 Abortion Bacilli and the Agglutination Test, Carriers of Bang, 479.
 Abortion: Some Laboratory Findings and Conclusions Which Puzzle the Practitioner. Bovine Infectious, 154.
 Address of the President, The, 9.
 Anesthesia, General and Local, 413.
 B. Tuberculosis (Avian) and Results of Subsequent Tuberculin Tests, Injection of Cattle with, 440.
 Bacterium Abortum, Controlled Vaccination Experiments on Cattle with, 37.
 Bacterium Pullorum, Single Tube Method for Determining Carriers of, 225.
 Blackleg Filtrate and Aggressin Based on the Aggressive Action of these Products, Potency Tests for, 67.
 Breeding Efficiency, Bacteria of the Genital Tract of Mares and the Semen of Stallions and their Relation to, 288.
 Business Principles as Applied to Veterinary Practice, 334.
 Calculi in Sheep, Urinary, 221.
 Carbon Tetrachloride, and the Use of Soft Elastic Globules for Preventing Inhalation-Collapse, Notes on the Treatment of Foxes with, 318.
 Cases in General Practice, Unusual, 732.
 Cervix, Surgery of the, 576.
 Challenge to the Veterinary Profession, A, 299.
 Chicken Pox and Roup by Vaccination, The Latest Method in the Control of, 619.
 Clostridium Botulinum Type C. A Pathogenic Anaerobe Associated with a Limberneck-like Disease in Chickens and Ducks, 723.
 Clover: The Cause of a New Disease in Cattle Simulating Hemorrhagic Septicemia and Blackleg. Damaged Sweet, 553.
 Colic in the Horse, Diagnostic Symptoms and Differential Treatment of Various Forms of, 204.
 Convulsions in Dogs, The Treatment of, 62.
 Cow-Pox, Introduced by Vaccination, Involving a Herd of Cattle and a Family, An Outbreak of, 93.
 Dog and Other Laboratory Animals, Practical Observations on Certain Diseases of the, 193.
 Dysentery, Swine, 600.
 Erysipelas, Porcine, 451.
 Extension Work in Kentucky, Veterinary, 342.
 Flu and Its Complications, Swine, 728.
 Flukes of the Genus Collyricium as Parasites of Turkeys and Chickens, 591.
 Fowl Typhoid, Chronic Carriers in, 329.
 Foxes, Temperature, Pulse, and Respiration of, 210.
 Glanders, with Special Reference to Glanders in Man, On the Serum Therapy of, 146.
 Hernia in the Pig, Umbilical, 705.
 Hog Cholera, Immunizing Young Pigs Against, 457.
 Hog Cholera Control Versus Prevention, 278.
 Honesty of Purpose, 611.
 Mastitis, with Special Reference to Etiology and Pathology, Acute Parenchymatous, 699.
 Molds in Silage and Their Significance in the Production of Disease Among Live Stock, 716.
 Pig Losses Can be Prevented, Excessive, 184.
 Placenta of Cows, The Treatment of Retained, 75.
 Pneumonia of Sheep, The Bacteriology of Progressive, 304.
 Post-Vaccination Trouble, The Significance of, 171.
 Practitioner as the Foundation of Veterinary Service, The, 26.
 Pyometra in the Bitch, 338.
 Rabies, The Control of, 616.
 Rabies from the Standpoint of Etiology, A Study of, 678.
 Rabies Vaccination Ordinance, Los Angeles County (California) Adopts, 697.
 Rabies Immunization by the One-Injection Method, Prophylactic, 690.
 Septicemic Disease, Perfect Physical Recovery of a Fowl may Follow an Attack of a, 623.
 Sterility in Cattle, 83.
 Tuberculin Sensitiveness Caused by Dead Tubercle Bacilli, 228.
 Tuberculin-Reacting Cattle, No-Lesion, 544.
 Tuberculin Injection, Double Intradermic, 346.
 Ulcer of Glans Penis Successfully Treated by Electrocoagulation, Indolent, 475.
 Vitamins in Milk, Source of the, 216.
- Personals**, . . . 133, 270, 404, 535, 658, 669 796

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 735 Book Building, Detroit, Mich.

W. H. WELCH, President, Lexington, Ill.

M. JACOB, Treasurer, Knoxville Tenn.

Executive Board

GEO. HILTON, 1st District; T. E. MUNCE, 2nd District; D. S. WHITE, 3rd Distr
J. A. KIERNAN, 4th District; C. E. COTTON, 5th District; B. W. CONRAD,
6th District; CASSIUS WAY, Member at Large, CHAIRMAN.

Subcommittee on Journal

D. S. WHITE

J. A. KIERNAN

The American Veterinary Medical Association is not responsible for views or statements published in the JOURNAL, outside of its own authorized actions.

Reprints should be ordered in advance. Prices will be sent upon application.

Vol. LXIV, N. S. Vol. 17

October, 1923

No. 1

A SPLENDID RESPONSE

The task of mailing approximately 4000 statements of dues was not completed until August 16. The first responses were received before all the statements had been mailed. August 20 was the banner day, when 160 remittances for dues were received.

At the time this is being written, a little over a month after the statements were mailed, approximately 1400 members are in possession of their membership cards for the current year. This is a splendid showing and is indicative of the good feeling which appears to prevail throughout the Association at the present time. It augurs well for the year we have just entered.

One reason for directing attention to the large number of members who have so promptly met their obligations is to remind even the larger number who have as yet not forwarded their dues. Every member who makes it unnecessary for us to send him a second statement saves the Association money. Multiply this saving by 2000, the probable number whose dues will remain unpaid October first, and it makes quite a sum. One hundred dollars would not be an exorbitant estimate, considering postage, stationery, printing and labor.

If you have not paid your dues, please do so before it slips your mind.

A MEMORABLE MEETING

The Montreal meeting will undoubtedly go down in American veterinary history as one of the most important gatherings of veterinarians on the North American continent. The meeting did not set a record, however, from the standpoint of attendance, the number of those present, estimated at about 800, having been exceeded at Columbus, in 1920, according to statements of several Buckeye members at the meeting. There were many features to contribute to the success of the meeting, and to place the credit in any one place would not only be difficult but unfair. The presence of two distinguished guests, Sir Arnold Theiler, of Pretoria, South Africa, and Professor Charles Porcher, of Lyons, France, gave the meeting a distinctly international atmosphere.

The members of the Local Committee on Arrangements were justly entitled to the unstinted praise which they received on all sides for the completeness of the preparations which they had made for the convenience of their guests. The Mount Royal Hotel made a splendid headquarters for the convention, the arrangement of the rooms for the meetings, both general and sectional, being particularly well adapted. As usual, several of the morning sessions were rather slow in getting under way, but, once started, President Welch kept things moving at a lively pace. One of the outstanding features of the business sessions was the absence of acrimonious debate, even though there were predictions that some rather spirited discussions were to take place. On the other hand, there seemed to be an atmosphere of peace pervading the convention hall at practically all times.

There was a little difference of opinion over the report of the Committee on Revision of the Constitution and By-laws, but this consisted merely of the statement of the opposing views of several members, on points where there is always bound to be some difference of opinion. The report was referred back to the Executive Board; the President was authorized to appoint a special committee to give further study to the proposed amendments, this committee to report to the Executive Board before the 1924 meeting. All amendments which have been proposed will be published in the JOURNAL again, sometime before the 1924 meeting, so as to permit the membership at large to study these amendments further and be able to vote upon them more intelli-

gently when brought up for adoption at the next meeting. This action appeared to meet with practically unanimous approval.

The Committee on Policy made its report to the Executive Board, which body, in turn, reported to the Association. It was decided not to adopt the policy at this time. It was the opinion of those present that the adoption of a policy was such an important procedure that it would be preferable to publish the policy in the JOURNAL, at an early date, so that every member of the Association may have an opportunity to examine it in all its details. The proposed policy will undoubtedly affect every member of the Association, in one way or another, and its publication in the JOURNAL, prior to adoption, will afford every member a splendid opportunity for studying it beforehand.

The report of Treasurer Jacob showed the Association finances to be in good condition, in spite of the unusually heavy drain made on the treasury the past year, incident to moving the offices of the Secretary and Editor and establishing the new headquarters of the Association.

The report of the Secretary-Editor showed the present membership to be 3967. Resignations were accepted to the number of 17. In most instances these members were resigning because of no longer being identified with the veterinary profession. Forty-two deaths were reported during the year, an unusually large number. Applications for membership numbered 206, of which 198 were accepted. Many references in the report reflected the wisdom of consolidating the offices of Secretary and Editor.

JOURNAL finances were shown to be in a healthy state, in spite of the unusually heavy expenses of the past six months, incurred in moving the JOURNAL equipment from Washington to Detroit. The final report of the Committee on Revision of Veterinary Anatomical Nomenclature was received and adopted, and the committee discharged. The Secretary reported that the Committee's report was now in printed form and that the Executive Board had authorized the sale of copies of this report, at \$2.50 each.

The election of officers resulted as follows:

President—Dr. C. H. Stange, Ames, Iowa.

First Vice-President—Dr. F. T. Daubigny, Montreal, Que.

Second Vice-President—Dr. H. E. Kingman, Fort Collins, Colo.

Third Vice-President—Dr. Geo. H. Hart, Berkeley, Cal.



The above group picture appeared in "La Presse," a Montreal daily newspaper printed in French, on the opening day of the meeting. Those in the group are, left to right, front row: Dr. L. A. Merillat, of Chicago, Ill., who responded to the address of welcome; Dr. D. Gencoux, Alderman of Montreal and member of the Local Committee on Arrangements; Sir Arnold Theiler, of Pretoria, South Africa, guest of the Association; Dr. W. H. Welch, President of the A. V. M. A.; Alderman Leon Trepanier, acting Mayor of Montreal; Dr. M. C. Baker, of Montreal, third vice president of the A. V. M. A. and Chairman of the Local Committee on Arrangements; back row: Dr. A. T. Kinsley, of Kansas City, ex-President of the A. V. M. A.; Dr. E. A. Watson, of Ottawa, Chief Annual Pathologist, Department of Agriculture; Dr. A. H. Baker, of Chicago, Ill., oldest alumnus of the Montreal Veterinary College (1876) at the meeting; Dr. H. Preston Hoskins, of Detroit, Secretary-Editor of the A. V. M. A.; and Dr. G. A. Dauth, of Montreal, Treasurer of the Local Committee on Arrangements.

Fourth Vice-President—Capt. R. A. Kelser, Washington, D. C.

Fifth Vice-President—Dr. Hamlet Moore, New Orleans, La.

Treasurer—Dr. M. Jacob, Knoxville, Tenn.

Secy.-Editor—Dr. H. Preston Hoskins (re-appointed).

While the tellers were counting the ballots, President Welch asked for the presentation of invitations for the 1924 meeting. Dr. E. R. Steel, of Grundy Center, Iowa, Secretary of the Iowa State Veterinary Medical Association, extended a very cordial invitation for the American Veterinary Medical Association to hold its 1924 meeting in Des Moines, Iowa. Dr. H. E. Bemis, of Ames, Iowa, seconded Dr. Steel's invitation, with the statement that he was conveying to the Association the invitation of President Pearson and the entire veterinary faculty of the Iowa State College, for the Association to meet in Des Moines.

Dr. A. T. Everett extended a very warm invitation for the Association to meet in Omaha, in 1924. Dr. Steel then moved that the Association recommend to the Executive Board that the 1924 meeting be held in Des Moines. This motion was seconded by Dr. J. I. Gibson, of South St. Joseph, Missouri, and carried. Dr. B. T. Simms then extended his annual invitation for the Association to meet in Portland, Oregon, in 1925. He expressed the wish that all other cities would refrain from extending invitations for the 1925 meeting, so as to leave the field open for Portland.

Mrs. H. P. Hoskins was then given the privilege of the floor, for the purpose of explaining to the members the nature of the Women's Auxiliary and what they were trying to do. She asked that those members having wives and daughters convey to them the message concerning the Auxiliary and urge them to affiliate so that the work might go on.

The Sectional meetings were very well attended, particularly those of the Section on General Practice. The papers were very interesting, and brought out some splendid discussions. Section officers were elected as follows:

SECTION ON GENERAL PRACTICE

Dr. Harry Caldwell, Chairman, 324 South Hale St., Wheaton, Ill.

Dr. E. R. Steel, Secretary, Grundy Center, Iowa.

SECTION ON EDUCATION AND RESEARCH

Dr. H. C. H. Kernkamp, Chairman, University Farm, St. Paul, Minn.



Cartoon by Le Messurier, which appeared in the Montreal Daily Star, Wednesday, August 29, 1923. The same evening, during the banquet, the original, in colors, was presented to President Welch, by Dr. Etienne.

Dr. E. M. Pickens, Secretary, University of Maryland, College Park, Md.

SECTION ON SANITARY SCIENCE AND POLICE

Dr. Orlan Hall, Chairman, 92 Fourth Ave., Ottawa, Ont.

Dr. J. H. McNeil, Secretary, Dept. of Agriculture, Trenton, N. J.

We will discuss the social features of the program next month, when we expect to have accounts of the various alumni gatherings, the women's auxiliary meetings, the banquet, the excursion to MacDonald College, the boat-ride and other features.

COMING VETERINARY MEETINGS

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. Oct. 3, 1923.

Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.

Southeastern Michigan Veterinary Medical Association. Detroit, Mich. Oct. 3, 1923. Dr. H. Preston Hoskins, Secretary, 735 Book Bldg., Detroit, Mich.

Dixie Veterinary Medical Association. Memphis, Tenn. Oct. 10-11, 1923. Dr. C. C. Brown, Secretary, Union Stock Yards, Memphis, Tenn.

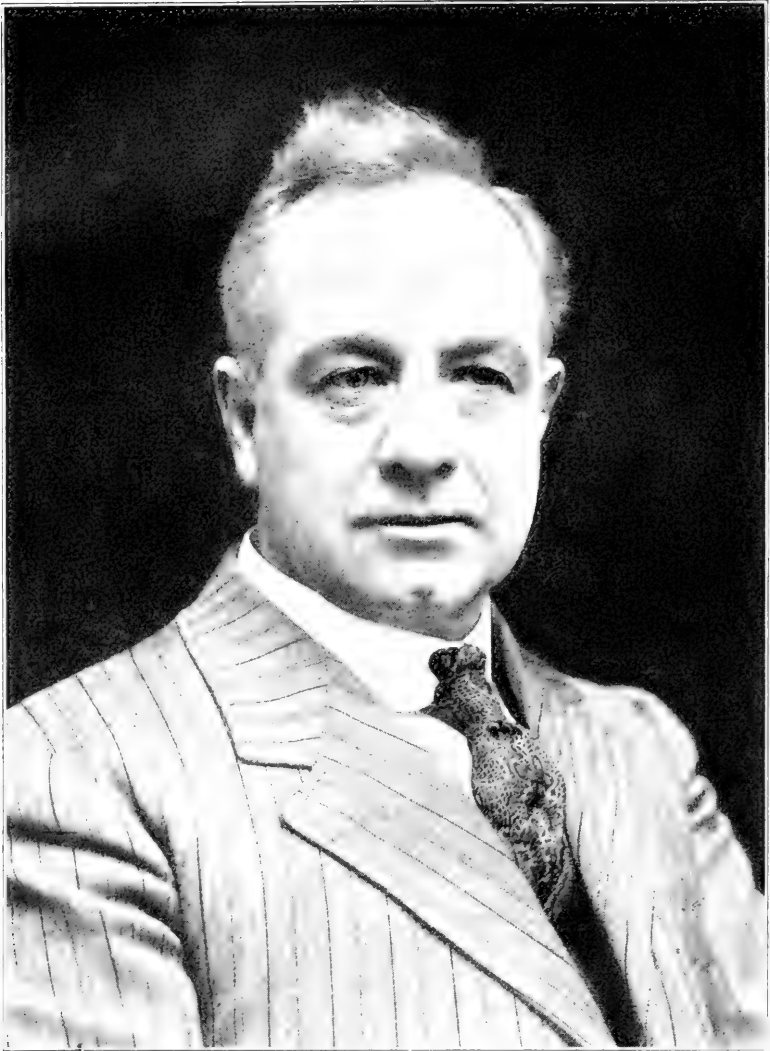
Eastern Iowa Veterinary Association. Cedar Rapids, Iowa. Oct. 10-11, 1923. Dr. F. J. Crow, Secretary, Iowa City, Iowa.

Massachusetts Veterinary Association. American House, Boston, Mass. Oct. 24, 1923. Dr. C. H. Playdon, Secretary, Reading, Mass.

Mississippi State Veterinary Medical Association. Grenada, Miss. Oct. 24-25, 1923. Dr. Hugh L. Fry, Secretary, Jackson, Miss.

Southeastern States Veterinary Medical Association. Greensboro, N. C. Nov. 12-13, 1923. Dr. J. I. Handley, Secretary, Box 1533, Atlanta, Ga.

U. S. Live Stock Sanitary Association. Hotel La Salle, Chicago, Ill. Dec. 4-5-6, 1923. Dr. O. E. Dyson, Secretary, 923 Exchange Bldg., Kansas City, Mo.



W. H. WELCH

President of the American Veterinary Medical Association
1922—1923.

THE ADDRESS OF THE PRESIDENT¹

By W. H. WELCH, Lexington, Ill.

Among the summarized duties devolving upon the president of this association, the delivery of an address during the annual meeting is mandatory. Being illy prepared for such purpose, either by ability or inclination, I crave your indulgence for presenting what must necessarily be found lacking in many of the time-honored details, when subjected to the scrutiny of those, who because of more intimate acquaintance with all the various activities of our profession, command a broader vision by reason of such contact. The view-point gained solely from the source of a plain, country practitioner, must naturally tend to dwarf and warp one's vision, and limit one's capacity for the full and perfect conception of our honorable profession, which in its entirety is so vast that it touches upon either the physical or financial welfare of all humanity.

The address of the president of any organization is usually of an inspirational character, and ordinarily consists of a graphic recital of the achievements of the past, while sounding the clarion to awaken the membership to the duties and opportunities of the hour, and visualizing the perfect future.

I would that I possessed the power to present appropriately for your consideration the glorious history of our profession, so young in years, yet so full of accomplishment, that were all our past services to humanity effaced from the records, the world would be set back an inestimable epoch in her progress.

Other professions exist, yet aside from our sister profession of medicine, none bears such important relationship to humanity and to human progress as does ours, and I would that I might impress upon the mind of every veterinarian the high call to duty and the wonderful opportunity that the present day affords to us and, like the artist, might outline upon the canvas of the future, that which would insure the fullest measure of professional progress, because our professional progress means human progress, and the world waits on us today for the solution of many problems.

I desire, at this time, to state that words are wholly inadequate to express properly to this association the profound grati-

¹Delivered at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

tude I feel for the great honor you conferred upon me, when you elected me as your president. When I think upon the past history of our profession, and the important part it has played in the progress of our nation; when I peruse the list of my predecessors in office, and contemplate upon the life of service which each so conscientiously rendered to his profession; when I consider others among our membership, far more worthy and deserving than I, by reason of having rendered valuable service, not only to this association and our profession, but to all humanity, and yet have failed to receive such recognition, I realize something of what a really great honor it is to be allowed the privilege of serving as your executive officer and shrink at my unworthiness.

THE PRACTITIONER RECOGNIZED

Let me assure you, however, that I have accepted this great honor and with it its responsibilities, in the same spirit that I know prompted its bestowal, which was that of a sincere and deserving tribute paid by this association to the humble practitioner, and gentlemen, on their behalf, as well as my own, I thank you with all my heart. The lowly toiler of our profession, who has courted no higher encomium than to be known as the faithful servant of the live stock owner, has nevertheless by reason of such contact, been the dignitary who has at all times proudly carried upon his shoulders the honor and reputation of our profession, and has shaped our destiny until he has builded us in the eyes of the world into the highly meritorious position that we as a profession occupy today.

It is therefore a tribute, as richly deserved as it was justly bestowed, and in crowning the lowly toiler of your profession you have enhanced and dignified the majesty of his calling. Moreover, you have given a proper exemplification of the proper functioning of all our various branches of veterinary activities, for it is only by a just recognition of the rights of each other that we will be enabled to reach the acme of success and as a profession to render the highest possible service.

I want to give testimony to the fine spirit of cooperation that has at all times been extended to me. It has made a real pleasure of what would have otherwise, at times, have been a hardship, had it not been for the willingness on the part of all to sacrifice personal and factional interests to the good of the common cause. I want especially, on my personal account, to thank the various officers, from the highest to the lowest, for each and all have

labored zealously in behalf of the association. Theodore Roosevelt once said: "Every man owes something of his time and talents to the upbuilding of the profession to which he belongs," and it has been in a spirit of this character that you have devoted hours and days to the service of this association and through it to your profession, and in addition to the greatest compensation that can come to man, which is that of the consciousness of a service well done, you have merited the sincere thanks of a grateful organization for whom your labors have been spent.

For more than half a century the leading veterinarians of our country have annually journeyed to a designated spot, there to compare notes on their progress, and otherwise to advance the interests and welfare of our profession. This meeting marks the sixtieth anniversary of our existence. Proud of our achievements of the past, the large attendance at this opening session of our conference lends inspiration to the present and foretells a profitable meeting. Besides providing the vacation that you need from your daily labors, this meeting may be likened to a short, post-graduate course, wherein the master minds of our profession are the instructors. It constitutes the very best means at our command for increasing our efficiency and usefulness, which is so necessary to cope with ever-changing conditions, and is the leading agency in spreading the gospel of enlightenment to our profession.

PUNCTUALITY ESSENTIAL

I am especially delighted to see so many ladies present. I believe that at no previous meeting have greater pains been taken to provide for your entertainment and comfort. Please do not forget, however, that much of your pleasure will depend upon your punctuality and the cooperating spirit with which you accept the entertainment provided. Try and make it as easy as possible for your hostesses, and when notified to be at a given spot at a stated time, be certain that your watch is correct, for the time schedule will be strictly followed and it will be your loss if you fail to be present.

Not only is this admonition applicable to the ladies, but I desire to emphasize its importance to the gentlemen. We have a definitely outlined program, and it is absolutely essential that we adhere to it strictly throughout the meeting. The business to be transacted here is of utmost importance, and the various problems to be discussed have a distinct bearing upon the future of this association and actively concern the personnel of our pro-

fession. Do your officers, the courtesy of being prompt in gathering at the different sessions; be brief and to the point in your discussions, and you will assist materially in expediting the business of the occasion.

Those who, in the past, have been regular attendants at our annual conferences, cannot but experience a tinge of sadness as our present assemblage proceeds to enter upon its labors, for truly there is something missing. During the past year death has exacted an unusual toll, and never in our past history has a twelve-month bereft us of so many shining lights. It is not my purpose to elaborate on this subject since our Committee on Necrology will report at a later period during our meeting, other than to state that the passing of such men as Drs. F. A. Bolser, J. W. Klotz, Olaf Schwarzkopf, Edward Merillat and J. G. Rutherford, who were more than national characters, cannot but be seriously felt by this association and our profession has been deprived of a very large portion of our most valuable assets. However, the influence of the lives of such men as these lives on, and becomes to us a sacred heritage that inspires us to nobler deeds and greater achievements. Peace to their ashes. They have not lived in vain.

SECRETARY-EDITOR

A few years ago, this association instructed the Executive Board to take steps toward combining the offices of Secretary of our association, and that of Editor of our JOURNAL, and to locate in a permanent home. During the last annual meeting the Executive Board reported that they had selected Dr. H. Preston Hoskins to fill this responsible position and their action was duly endorsed by the association. While there were those who opposed the change at that time, I believe that all will now acknowledge that, at least, no mistake was made in the selection of the man for this dual position and the wisdom of the choice is daily becoming more evident. Our association is to be congratulated on his acquisition, and may rest secure in the knowledge that the affairs and duties connected with this office will be conscientiously and ably cared for.

Valuable assistance may be rendered him in his official capacity as Editor, however, by our entire membership, who should forward to him for publication, reports of interesting cases and other scientific papers, as well as news items that are of interest to the profession, such as deaths, marriages, births, changes in location,

etc. I must confess that I, for one, like to read about the things that are happening to my colleagues, and I believe that others enjoy that feature also, and feel that it very properly demands a place in our JOURNAL. The secretary is the most important officer of any association, and the American Veterinary Medical Association is no exception. We might dispense with the services of a majority of all the other officers, and yet our association could continue to function and much progress would be made. The President, wisely limited to a year in office, can scarcely become accustomed to his duties, ere his successor assumes the leadership. It is therefore a wise association that having once secured an efficient and hard-working secretary retains his services from year to year.

VETERINARY EDUCATION

One of the primary objects given in the Constitution and By-laws for the organization of our association was "To elevate the standard of education." In that day the horse constituted 'about their only patient, and the appellation of "horse doctor" had about it the ring of truth. The instruction received in our colleges had reference in particular to the equine subject, and what consideration was given to other domesticated animals was largely for the purpose of comparison. Although advertising to educate veterinarians, our colleges, in the strictest sense, were doing little more than graduating "horse doctors." Gradually dairy farming became more and more an important feature of agriculture, while in the cities many veterinarians began to specialize in small animal practice. The establishment of the Bureau of Animal Industry, the field of original research and other avenues of employment furnished vocations for many veterinarians outside the field of practice.

Finally, with the discovery of a successful method of vaccination against cholera, the greatest scourge of the hog industry, our spheres of activities had so increased as to make impossible an adequate training for these various services with less than a four-year curriculum. The American Veterinary Medical Association has been the influential factor in causing the various colleges to keep abreast of the times. Step by step the courses have been lengthened, and the requirements for matriculation have been raised. I am certain that the standard of our veterinary schools was never so high as at this particular period. I am likewise of the opinion that the corps of instructors and the

equipment at the different veterinary institutions was never of such efficient character, but I wonder if they fully realize the demands that the future will exact of the successful veterinarian and are properly preparing him to meet that emergency?

I presume I am safe in saying that fully ninety-five per cent of all students who matriculate at the different veterinary institutions do so with the full expectation of engaging in private practice following graduation. Doubtless more than eighty per cent of all our graduates are actually engaged in practice. It is a well-established fact that the successful practitioner of today is almost as largely concerned with the problem of keeping animals well, as of ministering to the ailing, and he must be thoroughly familiar with everything that is to be known concerning all live stock on the farm, if he is to be rated above the county agent in knowledge. He may blunder in his treatment of the ailing, with far more safety than to advise wrongly concerning the handling of the well animals. Now, when our business brought us into contact with none but ailing animals, we perhaps could be excused for stressing that part of our education, but the graduate of today, without a superior knowledge of animal husbandry and a familiarity that is born only by intimate association with his patients, is certain to be an ignominious failure in any breeding community

A CRISIS REACHED

The veterinary profession has been passing through a great crisis, from which we have not yet entirely emerged, and largely upon the ability of the practitioner to make good at his job, depends the future welfare of the entire veterinary profession. He has been largely handicapped, and has not had fair play, and it is up to our veterinary colleges to see that a similar instance does not occur in the future. He was suddenly transferred from a job where he functioned almost entirely as a missionary, ministering to the ailments of the horse, the only animal which he had been properly educated to care for, and was thrust bodily into the realm of hog practice, a hitherto despised animal, unmentioned in any literature, save market reports, since the day the Holy Writ denounced him as possessed of devils. Regardless of previous education or experience, he was groping in the dark. He called pathetically for help to the bacteriologist, the pathologist, his old instructors, and strained his eyes in search of useful knowledge in veterinary literature, but all in vain, for these agencies were as helpless as himself.

Nevertheless, with all these odds against him, the practitioner is making good, and is rapidly convincing even the doubting county agent that in the future as in the past, the control of infectious and contagious disease is safe in no other hands than the veterinarian. We want no more such experience. The veterinarian of the future is going to be the most important factor in successful live stock agriculture, and his patients will include everything from the canary bird up. It is going to be a big job that will require both brains and an education that must be lacking in no single detail.

Thus, I plead for a greater stressing of animal husbandry, and all those fundamentals that must give to the student the most intimate knowledge of his future patients in health, ere he attempts to study them in disease. Not only this, but ere he is granted a diploma, he must be compelled to serve a tutelage under the direction of a capable practitioner, in order that he may develop a confidence within himself that can be born only of experience. An education that is not both practical and comprehensive in every detail, is obtaining money under false pretense, for it will fail to prepare him in an adequate manner for the successful future that would otherwise be his. We are a young profession, but we are proud of our triumphs, and if we are to continue to occupy the important relationship to agriculture that we now do, we must qualify to meet the demands of the future, which will call for only the very highest type of service.

BROADER EDUCATION REQUIRED

In the face of all this, we are confronted with the prospect of what purports to be a veterinary college, advertising to open its doors offering a three-year course to prospective students possessing an education the equivalent of one year of high school work. For shame! Events in the recent past have disclosed the fact that we are still suffering as a profession from the previous, low, matriculation requirements and low mentality that pervaded our ranks in the past. I say this without apology, for the ones to whom I refer are not usually found in gatherings of this character. We can never make progress by going backward, and when the handwriting on the wall discloses very clearly the fact that the successful veterinarian of the future must be an authority on practically all the various phases of live stock activities, we must agree that the school that does not

thoroughly educate and adequately train the graduate to fill this important position, for which the future demands that he be thoroughly prepared, will be turning loose upon the public an unskilled man with more than an even chance of proving a total failure in his chosen calling.

There is a relationship between the schools and the practitioner that cannot be ignored, because the success and prosperity of the practitioner is always reflected in the attendance at our colleges. Our schools are empty today, because of the financial conditions that have confronted the practitioner, in common with the live stock agriculturist. The dawn of tomorrow promises a clearing of the horizon, and to my mind these was never a more propitious time for a student possessing the proper qualifications to enter upon the study of veterinary science than now.

According to the statistics of 1910, there were 11,552 veterinarians in the United States, and 2,717 undergraduates in the various colleges. At the beginning of the World War, in 1914, the students numbered 2,487, while in 1919 they numbered but 722, decreasing in 1920 to 613. In 1921 they had further decreased to 535, and dropped still further, in 1922, when there were enrolled but 531. Against this decrease of numbers in the student body, may be weighed the encouraging facts that while in 1910 there were 199,000,000 animals, with an estimated value of \$5,274,000,000 in 1920 the animal population had increased to 215,000,000, with a total valuation of \$8,566,000,000, which figures do not include pet animals and poultry, both of which are daily increasing the income of the progressive practitioner.

A BRIGHT FUTURE

In round numbers there are perhaps not in excess of 8,500 practitioners in the United States to protect the owners of these animals from loss. It is estimated that through death and other sources of depletion, we are perhaps losing around 500 from our ranks annually, while recruits graduating from our schools are averaging 180 only. Even should our enrollments increase, beyond any period of our history, there cannot help but be an absence of veterinarians in many communities that would afford a lucrative practice. We can therefore give positive assurance that the profession has never offered better inducements to the prospective student possessing the necessary qualifications than now.

The reclassification of federal veterinarians makes the Bureau

of Animal Industry far more attractive than formerly, while the army also offers inducements that it did not once possess. Therefore, be of good cheer regarding the permanency of our profession. It is founded on the rock of successful, live stock agriculture, without which this nation must fail. Our real problem consists largely in attracting to our ranks a sufficient number of young men, of proper adaptability and moral worth, in order that the live stock industry may not suffer through lack of veterinary service, as seems most likely to occur within the near future.

VETERINARY EXTENSION SERVICE

During the past few years much conflict has existed between certain elements within the agricultural extension service and the practicing veterinarian, especially in those communities wherein swine production constitutes one of the leading industries. One method by which this service functions is through a county agent, a person who is a joint employee of the extension service and the existing county farm organization. Thus, as the live stock industry is a most important integral part of agriculture, the veterinarian, as guardian of the health of the animal population, is brought into close touch with this extension service. Both are earnestly concerned in promoting the production of a better class of live stock. Each, however, has a definite and proper sphere of activity, and any encroachment by the one, upon the prerogative of the other, cannot but work disaster to the very industry which each should be laboring conscientiously to assist.

Agricultural extension service has for its basic object the promotion and improvement of all phases of agricultural activities. In utilizing public funds and facilities in the furtherance of such service, all branches of the entire industry must be impartially considered and harmonious cooperation between the various branches becomes the paramount duty of all concerned. Its true mission and limitations may be very properly classified as strictly educational and promotive in character. Thus, the county agent tests the soil and advises the use of certain correctives, but the process of applying the commodity constitutes no part of his duty, although he is recognized as a specially trained soil expert. Thus, the work of education and promotion in the development of better live stock becomes the proper field of activity for the extension service, while the problem of protecting the animals from disease and rendering aid to the sick, as well as

sanitary and regulatory measures for preventing the spread of infectious or contagious diseases, rightfully becomes the sphere of operation for the veterinarian and constructive work is but hampered when any portion of this is wrested from his control.

Aside from the live stock owner, the person next most concerned in the success of live stock production is the veterinarian, because he enjoys prosperity only when the live stock interests are prosperous. Likewise, the veterinarian is absolutely essential to the live stock owner, since his business becomes too much of a financial hazard, when undertaken without competent veterinary service within call. There had always existed hearty cooperation between these two interests until the advent of the county farm advisor.

The changing conditions in practice had caused the horse to be superseded by the hog, as the dominating factor in earning a livelihood for the country veterinarian. During the war period, it had been necessary to operate all agricultural activities at their greatest capacity, and especially was the swine industry urged by the government to produce at the maximum. Conservation, by immunization against cholera, the greatest scourge of the industry was imperative, and both farmer and veterinarian were happy and prosperous.

The farmer had joined all the various farm organizations, and was contributing to them his financial and moral support. There had persistently been drummed into his ears such thoughts as "Agriculture is the basis of all wealth," "The farmer is the only producer who has absolutely nothing to say concerning what he shall receive for his wares," "Join our various organizations, and in a short time we shall be able to dictate to the world the price they shall pay us for our products."

FARMERS HOODWINKED

It was an Utopian dream, but at the dawning came Armistice Day, and their hopes became shipwrecked when the market for the farmers' products, at such previously high figures, ceased, while the majority of all other commodities, now fearless concerning government interference, since the cessation of hostilities, exercised the power made possible by reason of their various organizations and reaped the benefit of the close cooperation of their industries. The price of everything that the farmer produced dropped far below the cost of production, while everything necessary to his welfare, except veterinary service, went skyward.

Hard times were upon us, and the farmers having failed to realize immediately the benefits that they had been led to believe would result through membership in the various farm organizations, were refusing to continue as members. Some tangible benefits must be shown him, that he could acquire only through membership.

Here was sown the first seed of discord between the live stock owner and the veterinarian. Previous to this time there had existed the most cordial and confidential relationship. Like a clap of thunder out of a clear sky came the proclamation from the county agent, that the live stock owner was being robbed by his servant, the veterinarian, especially in the matter of swine vaccination. It was news to the hog owner, but being interested in retrenching in every manner possible, he gladly listened, while the county agent explained how he might effect a saving by injecting the serum himself.

AGRICULTURAL PRESS SHORTSIGHTED

This proposition would unquestionably have fallen flat, as it deserved to do, had it not been for the assistance rendered by some scurrilous and shortsighted farm journals, which, overanxious to exhibit a sympathetic attitude toward the sorely distressed farmer, kept their columns seething with articles derogatory to the entire veterinary profession, both as to his charges and as to character of service rendered. Let it be said to the credit of the higher class farm periodicals, as well as for the far-seeing county agents, that they each recognized the veterinarian as one of the fundamental necessities for successful live stock agriculture, and sought to prevent friction between them, by advocating a get-together policy, so that the veterinarian would not be deprived of work which he alone was specially trained to do, and that the live stock owner and the live stock industry might not suffer through the work being attempted by incompetents.

Veterinarians have never denied that there have been specific instances of overcharging, nor that a few incompetents were to be found in our profession, but we do declare that our skirts are perhaps as clean as are those of any other profession, not excluding those of journalism or county agents. There have been physicians, surgeons, dentists and lawyers, who have overcharged their patrons, as well as county agents who have surreptitiously received commissions on serum sold in their counties,

yet that should not condemn their whole profession.

The fact remains that farmer vaccination was promoted by a few unwise county agents, solely as a means to lure farmers into joining or remaining in the various farm organizations. There can be no other explanation. A man supposed to be endowed with the intelligence necessary to lead the farming population into a better system of farming, knows far better than to wrest the control of the most serious infectious disease with which this nation has to contend, from the hands of the only man possessing the technical training necessary to cope with it, and deliver it over into the hands of the incompetent novice, for he must realize that by so doing, he is jeopardizing the whole financial interests of the greatest live stock industry of the nation.

The agricultural extension service has never sanctioned the movement, but has rather sought to curtail the activities of the erratic county agents in that direction, and without the assistance of the press in spreading their misleading propaganda, it would have gained but little headway. However, the inevitable result is fast occurring. Farmer vaccination is not and can never be a success, and the spasm is subsiding, but not without somewhat disastrous results to both veterinarian and swine owner alike. The veterinarian who has weathered the storm is again finding his superior service appreciated by the swine breeder who has discovered his own incompetence.

The lamentable part of the matter is that there have been driven to other vocations, many capable but discouraged veterinarians, while the part played in discouraging young men from entering the ranks of our profession can never be truly estimated. Already, there is to be noted a change in the attitude of the farm press toward our profession, but the disaster that has followed as a result of their unfavorable and unjust criticism can never be wholly undone. The combined efforts of all the agricultural press, the various farm organizations, the live stock owners, and the veterinarians, can never prevent a great shortage of veterinarians during the next decade and it is the live stock interests that must suffer as a result.

NEGLECTING THE HORSE

The changing conditions that riveted our attention upon the hog almost caused us to forget our old friend, the horse. As one peruses the programs that have been offered at the various meetings of the different veterinary associations during the past

few years, the genuine horse lover cannot but experience a tinge of sadness when he realizes how shamefully the noble animal, that once afforded his only means of support, has been neglected and must consider us as heartless ingrates toward the benefactor that supplied us with luxuries at a time when we possessed no other friend.

Let me bring to you the message that the horse is coming back, and you who have so openly shamed and snubbed him, by refusing him a place on your programs, while you openly courted the favor of the tuberculous cow, or in humility worshipped at the shrine of the filthy swine, will ere long be sneaking back to your first love, and offering an humble apology to the one most indispensable animal belonging to mankind. Not only has he been neglected by the veterinarian, but he has received less publicity through the farm press than any other farm animal. Compare the horse advertisements that are paid for, with those of the cattle, sheep, hogs and poultry, in any of the farm periodicals, and it usually ranks second only to the cattle, but more columns of reading matter are given over to either of those other industries than are devoted to the horse. Possibly more reading space might be permitted him, were he not such an active competitor of truck or tractor.

Might I also suggest, that I feel that it is time that a little more attention were given him by our research departments. Periodic ophthalmia and navel-ill, two diseases that exact a heavy toll from the horse industry, are especially worthy of study, as well as others that might be named. It appears to me that science has never given to the horse the devotion that the subject has deserved. We have even permitted laws pertaining to eugenics that were harmful to the production of a better class of horses, yet as a profession have never raised our voice in opposition.

We have noted, with pleasure, and assisted many times, in the formation of calf, pig and sheep clubs, among the girls and boys, but how many of you have ever even suggested the formation of a colt club? Are you a member of the Horse Association of America—the only organization in the world that is spending a single dollar to advertise the economy of horse power? Are you advising your farmer patrons concerning the breeding of their best mares, and assisting them in locating a suitable stallion to patronize? The veterinary profession can at once be a power in assisting the horse in his “come-back,” and in that

manner confer a favor that his farmer friend will greatly appreciate within the next few years. "Do your bit."

VETERINARY LEGISLATION

This association in the past has never greatly concerned itself with legislation other than that of a national character. We have for years maintained a legislative committee, and they have done valuable work at Washington, but there are measures of great importance that affect the welfare of our profession, occurring in the legislative bodies of the various states, with decidedly more frequency than they do in the national body, and this association should place itself in the best position to render them every possible assistance. While it is a well recognized fact that all ills cannot be cured by legislation, and it is perhaps true that each state association supports a committee on legislation, yet the influence of the national association in such matters is not to be lightly estimated, as in most cases it will prove the greater of the two.

I do not believe that it is generally understood that such assistance from our organization is available, and steps should be taken to lend a better cooperation to the various state associations, in all matters pertaining to legislation. The time is at hand when we must no longer consider ourselves as simply a profession banded together in this association for the purpose of scientific progress, although that thought must be ever kept uppermost in our minds, but if we are to prosper as a profession, one that will attract capable young men to our ranks, we must not allow ourselves to lose sight of the material side, or we shall ultimately fail, both as an association and as a profession.

AN INTEGRAL PART OF AGRICULTURE

In our relationship to the nation, our profession is simply an integral part of the vast live stock industry, and we, as guardians of the health of that industry, must ever be the first to recognize the public's interest as overshadowing ours. It is clearly our duty, therefore, to assist the public through their live stock associations, legislatures, etc., to understand the veterinary needs that shall make for the best interests of all concerned. Our profession is justly proud of its achievements in the past, but we realize that we have functioned at our highest point of efficiency, only when vested with full authority, and receiving the hearty cooperation of those whose interests we serve.

We would still have pleuro-pneumonia, dourine and foot and mouth disease in our midst, had any portion of control been delegated to the laity. The work of tick eradication promises eventually that Texas fever will cease to exist in our country, and that the South may become a great paradise for the cattle industry. But the work has been fought, step by step, and even at this late day meets with violent opposition from those farmers who are most benefited. Glanders has long been kept in suppression and tuberculosis will eventually be driven from our land, but it will never be accomplished while tuberculin is accessible to the farmer.

Anthrax, blackleg and hog cholera can be kept in a state bordering on complete suppression, but it will never occur so long as vaccines for those diseases are in the hands of the laity. It is therefore imperative, before we can arrive at our highest point of service to the public, that such vaccines, viruses, sera and biologics as are used as diagnostic agents and in combatting contagious and infectious diseases, be accessible to none other than veterinarians. It will require time, perhaps, to educate the people to the necessity for such action, but time and experience will ultimately convince all concerned that there is no other way, and that the incompetent county agent and farmer are dangerous and expensive factors in the control and suppression of infectious and contagious diseases of all farm animals.

There are some very important issues of a sanitary character that demand legislation. During the foot and mouth epizootic, we had a practical demonstration of what could be accomplished in preventing the spread of contagious and infectious disease, by compelling the railroads to disinfect properly each car after use in live stock traffic. It was quite noticeable that the spread of *all diseases* of an infectious character were greatly diminished, yet in the face of such facts, the disinfection of cars ceased as soon as the foot and mouth epizootic was over. Personally, I believe that a very large percentage of all contagious and infectious diseases affecting farm animals might be traced originally to infected stock yards, cars or sale barns. Since the first establishment of horse markets, through which passed a large volume of the horse power of our country, millions of dollars have been annually lost to that industry, through deaths, and the various sequelae of infectious, respiratory troubles, that could have been reduced to a minimum had a rigid system of weekly

or even monthly disinfection of these cesspools of infection been required.

Of recent years it seems practically impossible to purchase a load of feeding cattle through the various markets without great danger of carrying to their destination some contagious or infectious disease that may affect either the horses, cattle, hogs, or sheep occupying the home premises. We are permitting infected cars to travel from state to state carrying both hoboes and flies. The hobo does not travel far on foot, therefore is the lesser danger in the spread of disease, but if we had accurate knowledge as to just how far a fly would travel, or the route taken after leaving an infected car, we might trace with greater frequency the obscure origin of many epizootics. The normal fee charged the shipper for the disinfection of the car will prove the cheapest item in connection with the traffic, and they are entitled to all the protection that can be given them along this line.

Another important problem lies in revising the majority of our present stallion registration laws. Twenty-six of our states possess laws requiring stallions to conform to certain qualifications before being allowed to stand for public service. The majority of these laws are a travesty on all the known facts concerning heredity, and shame a veterinary profession that permitted their enactment without registering the most vigorous protest. In most instances soundness is made the basis of registration, without reference to either conformation or other extraneous influence, while structural weaknesses that predispose their get to numerous ailments and blemishes are ignored.

I have not time to enter into detail other than to remark the unproved fact of the transmissibility of any disease directly from parent to offspring, barring syphilis, while it is a well-recognized fact that type and conformation, either good or bad, are decidedly heritable. These laws should be based on type, conformation and individuality, rather than unsoundness, and we should have no place for the mediocre stallion. We must ultimately have state and federal subsidies for our best stallions, if we desire to improve our race of horses. Let us cooperate with our various state and national horse organizations and point the way to an improvement in these various laws.

COMMITTEE ON POLICY

At the proper time during the meeting a specially appointed Committee on Policy will submit a report to the association

formulating our attitude toward certain other organizations and conditions that materially concern our profession. I consider this report and the matter of its adoption to be one of the most important questions that will occupy the attention of the convention. For years we have drifted aimlessly along, with no well-defined policy, other than a declaration of the objects which led to the organization of this association, and so far as other organizations and conditions are concerned there has been no attempt to adopt any specific line of action. This will serve to clarify matters in this respect and broaden our field of activities, commensurate with our involved interests, and prove of inestimable value to our membership.

As an organization it is necessary that we concentrate a part of our time and efforts on those matters that are of practical importance to our membership and profession, and while our highest ideal visualizes the practice of our profession as true service rendered to the least of God's creatures, yet "Man's first duty is to man," and we should guard zealously against any encroachment upon our prerogatives. And so I say, "All honor to the American Veterinary Medical Association for its achievements of the past, and Godspeed to an enlarged policy that shall in the future function for the best interests of all."

ANNOUNCEMENT

The Southeastern States Veterinary Medical Association will hold its next regular annual meeting in Greensboro, North Carolina, November 12-13, 1923. Many distinguished veterinarians will address the meeting, among whom will be Dr. C. H. Stange, President of the A. V. M. A.; Dr. Cassius Way, of New York; Dr. J. R. Mohler, Chief, United States Bureau of Animal Industry; Dr. T. E. Munce, State Veterinarian of Pennsylvania; Dr. W. J. Lentz, University of Pennsylvania; and Dr. C. A. Cary, of Auburn, Alabama. A large portion of the program will be given to practitioners on subjects pertaining largely to small animal practice. This will be a meeting that no veterinarian in the Southeastern states can afford to miss. Secretary Handley extends an invitation to any and all veterinarians who can arrange to attend the convention. Look for a copy of the program in the next issue of the JOURNAL.

THE PRACTITIONER AS THE FOUNDATION OF VETERINARY SERVICE¹

By E. R. STEEL, Grundy Center, Iowa.

The object of the veterinary profession should be to give the live stock industry and owners of other animals the highest type of veterinary service obtainable. To do this requires that we accept some definite policy and outline a constructive program in which veterinarians engaged in all phases of veterinary activities can function without interfering with the greatest usefulness of each other. As the foundation for such a service, I believe that the profession can well accept the practicing veterinarian and build upon him for the greatest benefit to all interests concerned.

Since the practitioner has been promised help from the American Veterinary Medical Association, it may be well to outline some of the things which we think could be done for our good and I will, therefore, offer some definite recommendations based on general principles. Criticisms which may be made are aimed to be constructive, not destructive, and progressive, not retrogressive; and suggestions that may be made for the improvement of existing adverse conditions are meant to be rational, not radical.

It is coming to be felt by very conservative men in the profession that some things must be done to encourage the man in every-day practice, if the profession is to endure and remain of the greatest usefulness to the interests which it serves. It is with this purpose, then, that I present this subject before the American Veterinary Medical Association, for I believe that if we are to bring about any reforms, we must work through the profession, not appeal to outsiders who can not comprehend our problems or appreciate our difficulties. Many of our ailments we have brought on ourselves, aimlessly perhaps, in most cases, and working out of them can only be accomplished by directing veterinary activities into proper channels.

To do this requires that all veterinarians in all phases of the profession do their part in constructing a forward policy and certainly, to the practitioner, the movement started this last year, as reported by the Policy Committee, is encouraging.

In a general way, some of the various activities of the profession

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association. Montreal, Canada, August 27-31, 1923.

which are affecting the practitioner may be considered with a view to getting at the real problems for solution. Veterinary education, teaching of veterinary science in agricultural colleges, extension activities, federal and state medicine, commercial enterprises and the work of the practitioners themselves are some of the matters towards which this Association should undertake to work out a definite policy. A brief discussion of each of the above topics will be attempted and definite concrete suggestions offered for their handling, keeping in mind the idea of the greatest service which may be rendered the public and basing that service on the practitioner as the foundation.

First, this Association has done a great work in raising the standards of veterinary education. To maintain these standards will take the united efforts of the profession and, I believe, the practitioner will insist that they be kept up through requirements of state board examinations and basing practice acts upon these standards. If the profession is worth while entering, the level of the other professions is the lowest level we can accept and it is none too high at the present time considering the fields we are required to serve. Practitioners can be depended on to see that veterinary education maintains its standing so recently achieved. There is no complaint from practitioners that they have been taught too much; rather, no one realizes his shortcomings more than the man who has to answer the demands of general practice.

Whether it is sufficiently remunerative, however, to enter the profession at all is one of the questions running through many minds at this time. The practitioner has been made to meet these high requirements; but what protection has he been given after he has met them? He is turned out with his own native ability and acquired learning to cope with all sorts of discriminating circumstances. This Association has done a good work in raising the standards; but it has done practically nothing in aiding the practitioner when once he has passed out of the school into his chosen field.

In recent editorials, we have been asked to recommend the profession to the prospective student. Many of us feel that we cannot conscientiously do this, and the present shortage of veterinary students is due directly to this feeling among the men who have been approached upon this subject. This feeling of what is coming next to take away the income from the practitioner, must be dispensed with and he must be encouraged if

he is to recommend the profession to those whom he could direct into our colleges.

There is no need to spend thousands of dollars in publicity, for it will be wasted; there is no need to send enticing appeals to high school graduates, for they will see "Doc" first before answering. Just back up the men the schools have already turned out and encourage them and our schools will automatically fill up. The faculties of our colleges are beginning to see that they must recommend their graduates to the live stock owners and they must protect them against encroachments if the schools are to maintain the quota of students desired.

It is said the law of supply and demand will operate. It is operating. We have veterinarians to spare in many sections now and none in others because the demand for the veterinarian has been lessened or at least not stimulated. The supply will be short; but if the public is taught to get along without veterinarians, the demand will not increase. As regards veterinary education, then standing behind the man already in the field is the only way to maintain a high type of veterinarian which our schools are now qualified to turn out.

The teaching of veterinary science in agricultural colleges is an activity of the profession with which this Association has not concerned itself, except that several years ago a committee was appointed to investigate the extent of such instruction offered and it reported only as to the amount of work which could be accredited towards a degree in a recognized veterinary college. It did nothing, by way of recommendation, with the work which was of such a character that it could not be accredited. This, in my mind, is the one issue which should have been handled, for it affects the profession as a whole; the other could be decided by the deans of the colleges.

There is a great deal of loose teaching of veterinary subjects in our agricultural colleges and I believe that the veterinarians engaged in this work would welcome some rulings in a general way from this Association. If they could say to their superiors that the American Veterinary Medical Association outlines the scope of such approved teaching, it would strengthen many men who would do differently. By some, it has been argued that in their states the live stock interests demanded some sort of instruction in so-called simplified veterinary science, due to shortage of veterinarians in certain parts of the state. What effort has been made to give those territories a county or district

veterinarian? That would be teaching the value of a veterinarian. Rather, they are teaching these people to get along without graduate veterinarians and incidentally they are seeding down the country with quacks, which will make the territory untenable for a graduate veterinarian. We can't make progress by resorting to retrogressive measures.

I suggest that this Association recommend that the teaching of veterinary science in agricultural colleges be limited to teaching subjects accredited towards a degree in a veterinary college and to other courses in veterinary sanitation and control of infectious diseases through the aid of veterinary assistance. The teaching of specific treatments should be discouraged, for treatments can be given properly only by one who is qualified through training and experience to recognize disease and treat it, which is taught in veterinary colleges only.

The Committee on Intelligence and Education has investigated the teaching of veterinary subjects in our veterinary colleges, but to my knowledge, the teaching of veterinary science in agricultural colleges has never been given serious attention. Why make the veterinary colleges meet a certain standard and their graduates comply with the requirements, and then let others carry on loose teaching and their students meet no requirements? Higher veterinary education is being attacked by these activities and it becomes the duty of this Association to take a stand in this matter, since it has taken upon itself regulatory authority in veterinary education.

If this loose teaching in our agricultural colleges affected only the areas not occupied by graduate veterinarians, it would not be so bad; but, unfortunately, it is not kept under control. We are bothered with it in states in which veterinarians abound and indeed about the only states not affected by it are those maintaining veterinary colleges and even in them the matter must be fought constantly. This question must be handled as a national issue for we do not live to ourselves. Areas formerly occupied by graduate veterinarians have been deserted through the demoralizing influence of some of the phases of this instruction in our agricultural colleges. Certainly the live stock owners will not benefit by such conditions and if we are to give them the highest type of veterinary service, such influence should be checked.

Closely related to the above question is the veterinary work of extension departments and States Relation Service. This is a

veterinary activity which could be made an asset to the practitioner and in some instances it is being made so by the extension veterinarian; in other cases it is being used to undo the profession and teach the veterinarian's client to get along without his services.

It is unbelievable that a farmer can be taught subjects in a few weeks or days, or in a single lecture, which are not taught in a veterinary college until the senior year. If the live stock owner can be taught such work intelligently, then it is foolish for veterinarians to be required to spend four or more years in college. If they can not, then it is dishonest to tell them they can and give them licenses making them think they are qualified to do their own veterinary work. Either the veterinarian or the farmer is being fooled. From my personal experience in doing this work and from my acquaintance with others who are now conducting such instruction, I judge that it is the latter. These courses are more or less a joke and the veterinarians doing this work feel that they are trying to do the impossible, for it is no pleasure to talk to men about matters which they can not comprehend.

The farmer vaccination schools in Iowa are probably the most advertised examples of this adventure. Here the farmers are collected for a few days and given lectures covering perhaps nine hours. During this time, they are given repeatedly the questions they will be asked on the examination and they are allowed their notes during the examination. What if veterinarians in our colleges were allowed to get by in such a fashion? Let us be honest with ourselves and with the interests which we serve.

The only possible results of such loose instruction is the multiplication of quacks and farmer vaccinators who experiment on their neighbors' hogs and make a wage at it, for no one will work for nothing. It is left to the veterinarian to see that this does not develop; but he knows that if he meddles in such matters he may as well move, so he lets the situation work itself out one way or the other. There are no state inspectors to enforce veterinary laws as there are for others.

Rather than try to control such activities, the profession should use its influence to correct the evil. I know of no way except through the veterinarians themselves engaged in these activities. If they will, they can convert all this work into a benefit to the profession. Some think that the laws require the work and they may as well do it as some one else. However, if those requesting this work could not influence veterinarians to do things which

the veterinarians themselves know are not right and not for the best interest of the profession and the live stock industry, these radical instigators would get nowhere with their political manoeuvres.

The American Veterinary Medical Association should outline a definite policy regarding such instruction which would help the veterinarians engaged in this instruction defend their position when asked to do things they should not. The suggestion I have made regarding teaching veterinary subjects in agricultural colleges, I make here too: That such instruction be limited to teaching principles of sanitation and control of infectious diseases through proper veterinary assistance. This could be made in the form of a recommendation rather than an arbitrary ruling.

Next, federal and state medicine are becoming a menace to the man in practice. I would not infer that these important veterinary activities are not essential. Their work is excellent and of far-reaching influence; but, surely, there is enough for all of us to do in our own spheres without interfering with the usefulness of each other. Federal and state veterinarians cannot take the practitioner's place in the service to the live stock industry; but they can make his business such that it will become unprofitable for him to stay in practice. The simple suggestion that I would make on behalf of the practitioner and for the best interest of the public welfare, is that federal and state activities be limited to doing such work that the practitioners can not do efficiently.

The most notable intrusion violating this principle is the work of federal and state departments in taking over the testing of cattle for tuberculosis. The accredited-herd plan was the first to require that only a veterinarian on full-time pay of the state or federal government be allowed to do the testing. The practitioner was enticed to influence his clients to sign up the agreements with the understanding that this work would be turned over to him. In full confidence in this purpose, he influenced perhaps ninety per cent of all signers of agreements to enter the plan. In other words, he created work for federal and state employees, simply that his client might receive indemnity for his reacting cattle, for there was an arbitrary ruling that indemnity would not be paid on the practitioners' test. To my knowledge, the live stock owners have never been consulted as to their choice in this matter.

After the accredited-herd plan had become popular through

the influence of the practicing veterinarians, it was extended from the breeders to owners of grade herds as well and to communities wishing milk ordinances requiring the tuberculin test. Still the work remained in the hands of the veterinarian employed by the federal or state government. Realizing that this limited testing would not control or eradicate tuberculosis, the work has now been extended to cover counties. Still, it is proposed in some states at least, that this work be kept in the hands of the full-time veterinarians. The man who did most of the missionary work in fostering the accredited-herd plan is thus left out of consideration, except that he is still promised that the testing will be turned over to him ultimately.

It is now proposed, however, that a county veterinarian do the area testing. Can we control this county veterinarian movement? In my opinion this step is entirely unnecessary in communities well supplied with veterinarians; yet it is being inaugurated in such states as Iowa and New York.

As I have shown, the practitioner has been fed up on promises, and if this work does not go into his hands, he will be justified in believing that he has been wronged. If his antagonism is aroused, this work will certainly fail and, I believe, federal and state officials are making a mistake in not taking the practicing accredited veterinarians into this movement. If they are qualified to take over accredited herds, they are qualified to run the initial tests.

I would recommend that accredited practicing veterinarians be used all that is possible in area testing, in cooperation with federal and state veterinarians, the latter acting as checks and doing supervisory work. In place of a county veterinarian in areas well supplied with veterinarians, I would suggest that this individual be given two or more counties, if possible, to keep away from localizing the office to the county. This plan would meet the approval of the practitioners and better satisfy the live stock owners, who, for the most part, want their veterinarians to do this work. All they are asking for is indemnity, not the free test, for they realize there is nothing free about it, the bill being paid through taxes. They prefer to call their local veterinarian when they can arrange to do the work, rather than line up a whole community for some particular time without any consideration for their convenience.

If appropriations are used only for indemnity, more cattle can be tested with the money. If indemnity is paid on the test of

one class of veterinarians, it should be paid on the others, or no indemnity paid at all, which would stop the work, for it is demanded by the owners of reacting cattle. By not paying indemnity on the test of practitioners, the government is encouraging dishonesty by influencing men not to tag and brand reactors. Further, it is discouraging testing.

In all other phases of federal and state activities as well, the government should abide by the simple rule of not transgressing into fields which can be handled by the qualified graduate veterinarian. That would be my suggestion, in a general way, that this Association recommend in behalf of the practitioners and for the best interest of veterinary service to the live stock industry.

Veterinarians in commercial institutions can do a great deal of good in directing veterinary activities into the hands of graduate veterinarians. It is becoming clear to many such concerns that the logical salesman of their goods, as well as administrator of their product, is the practicing graduate veterinarian. In fact, the whole fabric of the profession in its various fields is dependent on him for its stability. Like in many other branches of the profession, certain arbitrary rules cannot be laid down in the question of sales policy; but the ardent advocate of unprofessional business methods should not be tolerated. A definite policy recommending in so far as possible the keeping of veterinary commercial products in the hands of the graduate veterinarian should be instigated in the interest of keeping this work in the hands of the man who has qualified to serve the public good.

The practitioners themselves, in all the above considerations, come in for their share of criticism. In my opinion, the average ability of practitioners runs as high as that of veterinarians in other fields. There are poor men in all branches. The qualifications of each are the same. The practitioners in some instances have been criticised for not measuring up to the expectations of the profession; yet, the practitioners are just what the profession has made them and in criticising them in general, the whole profession is condemned. Rather, we should start with the graduate veterinarian as the lowest standard we can accept in veterinary service and build up the practitioners rather than substitute them with men of lesser training. This can be done by increasing the efficiency of the practitioner in any line in which he may be weak. Short courses in veterinary subjects for practitioners are being encouraged. They should be more definite, if anything, along some particular line needed, as for

example, a two-weeks course in milk inspection work, or longer, if necessary.

Rather than turn veterinary work over to laymen, because of the incompetency of some practitioners, it would seem more constructive if such men were required to meet certain requirements, as for example, the accredited-herd examinations. We have been going back 35 or more years in our development by resorting to retrogressive measures in order to meet the criticism of some practitioners. The whole profession is suffering as a result of such methods. Certainly, it becomes the duty of the American Veterinary Medical Association to decide on some basic standard for veterinary service and I suggest that the practitioner be taken as the foundation of that service to the live stock industry.

SUMMARY

1. The faculties of veterinary colleges, through the American Veterinary Medical Association, should use their influence to protect and encourage their graduates in practice and recommend them to the live stock industry.

2. The teaching of veterinary subjects in agricultural colleges should be limited to the teaching of principles of sanitation and the control of infectious diseases by proper veterinary assistance; and to teaching subjects accredited toward a veterinary degree; specific treatments of diseases should not be taught.

3. Extension departments should abide by the same rule. They should teach the farmer the proper appreciation of his veterinarian, rather than attempt to show him how to do his own work.

4. Federal and state activities should be limited to doing such work that the practitioners cannot do efficiently. Federal and state veterinarians could be placed only in areas not occupied by practitioners.

5. A definite policy recommending in so far as possible the keeping of veterinary commercial products in the hands of the graduate veterinarian, who has qualified to handle them, should be approved, as in the best interest of the live stock industry.

6. Practitioners themselves should be built up in their weak places and their efficiency increased rather than substituting them by men not trained as well. A definite plan for bettering the practitioners should be inaugurated by the American Veterinary Medical Association.

CONCLUSION

In response to invitations to practitioners from your President and Secretary, for definite suggestions for helping the practitioners, I hope I have submitted constructive, progressive and rational recommendations. It is only reasonable that if the graduate, practicing veterinarian must measure up to the high standard expected of him by this Association, he should be given its support. Did it ever appeal to you, that the practitioner is the only man in the profession who is subject to our code of ethics? The Bureau of Animal Industry may advertise as it pleases, an extension veterinarian may carry on a regular correspondence school for quacks, any other veterinarian than the practitioner may conduct his work independently of the code of ethics of this Association. Why should not the American Veterinary Medical Association place restrictions upon other fields of the profession?

If all veterinarians in all phases of our activities will do their part to encourage the man in practice, the future of the profession is bright. Since the practitioner occupies a place in the service of the community that no other member of the profession can fill, he should be taken as the foundation of that service. Undermine him and the whole structure will totter. These suggestions, I believe, have the endorsement of practitioners everywhere. The practitioner, we think, is and must remain the foundation of veterinary service.

DISCUSSION

DR. FERNEYHOUGH: I was very much impressed with that paper, and I wish to say that I have had the honor of being in Virginia, as an official, for a number of years. I would not care to hold a position down there unless I thought I had the practically unanimous vote of the veterinarians of the state.

Now, the Doctor touched there on a question that I am very much interested in. We have a written test course and if I am not mistaken (if I am wrong, Dr. Kiernan can correct me) we passed last year a regulation whereby we pay a certain amount of indemnity when the veterinarian makes the test.

At first I hesitated to ask the boys to take this accredited examination, but after thinking about it, I thought it was a pretty good thing. I appealed to the veterinarians of the state, and now there are very few veterinarians in the state who have not taken an accredited examination.

I had a chance recently, gentlemen, to test the value of the support of the practitioner in Virginia. It hasn't been very long since one of the most prominent men in Virginia questioned the test applied by the agent from the state office. He was sent there from the B. A. I. to test the herds of one of our United States Senators. I didn't know anything about the test until a week afterwards, when I was appealed to, to re-test these animals.

I said, "Upon what grounds?"

I told him there were only two things I would re-test for, if I thought there was anything wrong with the test at the time, and if I thought the man incompetent.

He said, "I say he is incompetent."

I said, "Your saying so doesn't make it so. You will have to prove it."

The first thing I did was to sit down and write to the practicing veterinarians in every community in which this man was testing. Every one wrote me nice letters and said as far as they knew this man's word was worth one hundred per cent.

I could find nothing wrong and I stood back. The thing was taken to the government; taken to the Live Stock Sanitary Association, into the courts and is still standing by.

Now, what I want to mention is this: The Virginia State Veterinary Medical Association met in Richmond, in January, and here is the resolution they offered and passed. They passed a resolution asking the Live Stock Sanitary Association to instruct the State Veterinarian to refuse to approve the work of any practitioner in Virginia who would knowingly re-test an animal passed by the state as a reactor. That is the report we get in Virginia. If a man gets those retested, he goes out of the state to do it.

This man finally found a man out of Virginia, who would do it. Thank God, it wasn't in Virginia. I carried him through the courts. I was enjoined once by the courts to show why. Finally I watched him. All you have to do is watch a rascal. You will find him out.

Gentlemen, stand by the man in the field. Let me tell you, you can make scientific men by training them, but God Almighty makes honest ones. Don't think because you are working for the B. A. I. that you are above doing a lot of little things. For God's sake, don't sell your birthright for a mess of pottage.

Dr. Steel brought out some mighty good things in that paper. I want to tell you, gentlemen, if you treat the practitioner right, he will stand by you. I have had to turn insurance men down. I had to turn a man down a year or two ago. Some one said, "Ferneyhough, he is after you."

I said, "Let him come. The bigger the man the harder he falls." (Laughter).

Sure enough, in the trial, this fellow walked up to me and said, "I want to see you a minute."

I said, "All right."

He said, "I want to tell you I am here to support you. You are right."

Men, you will get that. Men don't mind your disagreeing with them if you are right. Be right and be honest, but for God's sake, when a man attempts to get you to do a wrong thing and you know it is wrong, don't do it. Treat these practitioners right.

What is worth five dollars to get a practitioner to do, the same endorsement is worth a thousand to get an official to do. (Laughter). Take our good friend, Harry Caldwell—if his endorsement on a crooked deal would be worth five dollars, what would the endorsement of a Bureau man be worth? Ten times as much.

That was a mighty good paper and I think it is just a question of misunderstanding of one another. If we will all get together and treat the practitioner right, he will treat you right. I am very proud of your paper, and congratulate you. (Applause).

TRY THIS ON THE COW

(Letter received by a Kentucky physician. *Jour. A.M.A.*)

Dear Dr:—

Dr. Brown made an expiration picture of my stomach for \$25.00 one mo. ago and he says my manifold was hanging out of place so my grub won't pass thro. Send me some medicine for my trouble and I will pay you well.

CHARLEY B.

CONTROLLED VACCINATION EXPERIMENTS ON CATTLE WITH BACTERIUM ABORTUM¹

By G. H. HART and C. M. CARPENTER²

University of California, Berkeley, California

INTRODUCTION

The possible value of live abortion germ vaccine in the control of bovine infectious abortion has been recognized since the early work of Bang¹ published in 1897. This investigator obtained definite protective results in experiments on sheep, goats and cattle. Later it was studied extensively and used in the field by McFadyean and Stockman,^{2,3} of the British Ministry of Agriculture. It is at present being distributed by this governmental agency to owners of live stock in England.

Experiments by Hadley⁴ of Wisconsin, Huddleson⁵ of Michigan, and the U. S. Bureau of Animal Industry, as reported by Schroeder,⁶ seem to show that its administration is followed by a lower incidence of abortion in the treated than in unvaccinated control animals. Thus, in Hadley's experiments of 127 unbred heifers vaccinated, 77.9 per cent calved normally while only 66.7 per cent of the controls did so. The best results were obtained in open cows which had never aborted. In this group the vaccine was 91.8 per cent effective, which was in marked contrast to 44.4 per cent of normal calvings for the controls. In open cows which had aborted, the vaccines were of little value, and, as was to be expected, in cows which were pregnant at the time of vaccination, but had never aborted, there was a higher percentage of abortions in the vaccinated than in the controls. The total vaccinated cattle from which these data were obtained numbered 439 head, of which 14.1 per cent aborted, while in the 101 controls 31.2 per cent aborted. The results varied in different groups; the highly favorable ones were obtained in the group consisting of open adult cows which had never aborted. The vaccinated cattle also showed a lower sterility rate and an increased breeding efficiency over the controls. Despite the comparatively large number of animals in the experiment, the writers warn against the danger of passing premature judgment on the value of any therapeutic agent for contagious abortion.

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

²Drs. C. M. Haring and J. Trautman participated in the planning of this work and Dr. J. Trautman in its actual prosecution to September 1, 1922.

Huddleson's experiments cover a much smaller number of animals and they were not under such close observation, but he concludes in regard to Herd A: "These data apparently indicate a decrease in the abortion and sterility rate of the treated animals and a marked increase in the breeding efficiency of the treated over the untreated animals." In regard to his work on both herds A and B he states: "These data, while very suggestive, are too few to warrant final conclusions as to the value of vaccine treatment."

Schroeder's report covers twenty-three cattle which were part of a drove of sixty-six, none of which, according to the tests that could be made, as infected with bovine infectious abortion. Eleven received subcutaneous injection of pure living cultures of *Bacterium abortum* about two months before they were served by the bull. Four received repeated injections of killed cultures of the abortion organism after they had become pregnant, and eight were retained untreated as controls. The twenty-three cattle were equally and similarly exposed to abortion infection. The exposure was *via* the digestive tract and the material used was obtained from actual cases of infectious abortion. Of the eleven cows treated with live organisms before conception, ten calved normally and one aborted; of the four that received dead organisms, two calved normally and two aborted; seven of the eight controls aborted.

Despite the rather widespread use of this method in controlling abortion, it is generally considered to be still in the experimental stage. Careful investigation regarding its efficiency in controlled experiments, the deleterious effect of the use of this method on the vaccinated animals, the length of time the infected organisms remain viable in the animals, the effect on subsequent breeding and other questions, have been so rare that general confidence in the method and even the justification for its use, are open to severe question in the minds of many investigators and live stock sanitary authorities. Bovine infectious abortion is a self-limiting disease and, therefore, very good opportunity exists for any measure directed toward its control to gain credit for results which might have been identical, had nothing of a preventive nature been done. For this reason, only those experiments which have control animals can be given very much weight.

In the work on bovine infectious abortion which has been under way at this Station a prominent place has been given to

this phase of the subject. It was designed to furnish information on the important and still unsettled question of the actual value of live abortion organisms in producing immunity, to throw additional light on the localization of the injected bacteria, and to determine whether or not it is necessary, in the production of immunity in *Bacterium abortum* infection, to have actual multiplication and activity of the organism in the animal body, or whether it is an immunity that is conferred upon an animal simply as the result of having been infected with the disease.

It was expected that the investigation would also show the extent to which the infection, resulting from both the inoculation experiments to produce immunity and the ingestion experiments to produce infection, would be injurious to the animals infected and also to animals associated with them.

The following is a chronological history of the experiments:

GROUPS OF CATTLE

Three groups of female animals were used in the experiments, totaling forty-five head. Two experiment bulls were kept with these animals, in addition to which recourse to the dairy bull was obtained where mentioned. This bull has been with the dairy animals since August, 1917, and he, together with the other animals there, is free from *Bacterium abortum* infection, as determined by extensive blood tests and milk examinations. (Reported in Part III, Bulletin No. 353, of this Station).

Group I consisted of twenty animals and was the group used to determine the efficiency of live abortion organisms given in the form of vaccine in the prevention of abortion.

Group II consisted of fifteen animals and constituted the control group. Ten of them actually received infectious material to produce abortion and five were left as association animals.

Group III consisted of ten head to receive vaccine and no further treatment, in order to ascertain how long *Bacterium abortum* would remain in their bodies as a result of a single exposure by subcutaneous injection.

SOURCE OF CATTLE

These forty-five animals consisted of fifteen taken from the University dairy, all of which were known to be free from infection with *Bacterium abortum*, and five animals of beef strain which had been in our possession for several years, having been originally purchased as young heifers for tuberculosis experiments but not used. Twenty-five head were dairy heifers pur-

chased after a negative blood test from four herds with negative histories of abortion. Twenty-three of these were unbred. The two bulls were obtained from one of the certified dairies where they had been raised. They were about fifteen months old at time of purchase. The animals were assembled and kept for several months, with exceptions noted, and negative blood tests obtained in all cases before the experiments started.

DISTRIBUTION OF CATTLE

When the animals were divided into groups they were placed in separate fields as shown in Figure 1. These pastures that were used for the experiments constitute the north side of a canyon. The land is sloping and hilly and the drainage is in one direction, from the upper part of the illustration to the lower, into a creek which flows down the center of the canyon during the rainy season.

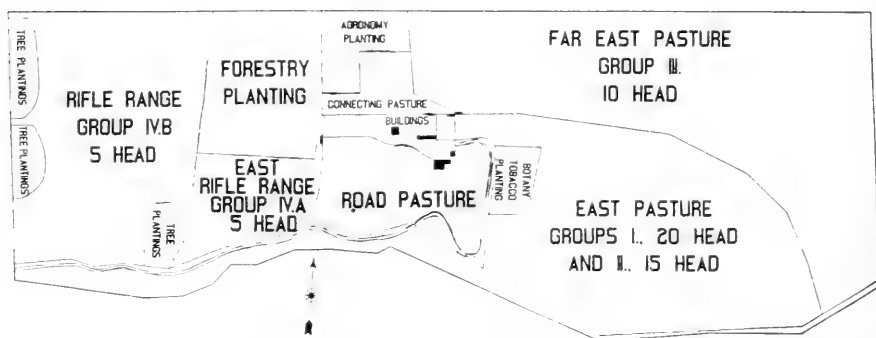


Fig. 1. Plot plan of buildings, corrals, and pastures in Strawberry Canyon, University of California, Berkeley, occupied by experiment cattle in abortion investigations. Total area approximately 125 acres.

Drainage from the far-east pasture can, therefore, run through the east pasture and from the connecting pasture into the area occupied by the buildings and the road pasture. The remainder of the land drains directly into the creek. These facts were kept in mind in placing the animals, so that infection from one group to another would not take place through the medium of drainage. The experiments covering the animals in Group IV, A and B, are not included in this report.

STARTING OF THE EXPERIMENT

The experiment was actually started on February 7, 1922. At that time fourteen animals, to constitute Group II, were given

a final examination for pregnancy preparatory to placing them in the far-east pasture (Figure 1) with the two bulls. One animal, 401-A, was found on rectal examination to be in early pregnancy which had not been recognized at time of purchase. One dairy animal, 2060, was definitely known to be pregnant to the dairy bull. One other dairy animal, 2304, definitely known to be pregnant to the dairy bull, was found to be too far advanced in pregnancy to remain in the experiment and was returned to the dairy. This left thirteen animals in this group. Two others were added later to make fifteen, the desired number. These two animals, 2298 and 436-A, respectively, were pregnant when added, the former being a dairy animal and the latter purchased with the animals for Group IV, not recorded in this report.

VACCINATION OF GROUPS I AND III

On the same date, February 7, 1922, the thirty animals in these two groups were placed together in the road pasture (Figure 1) and injected with live-abortion-germ vaccine. Each animal was given subcutaneously, at one point on the left side of the neck, twenty cc of the material. The area at which this injection was made was previously washed with a three per cent cresol solution as would be done in routine field practice. The animals were placed in the road pasture (Figure 1), so as to have the east pasture empty, as a separation area from Group II, to prevent the bulls in the latter group from attempting to get to them in case any showed evidence of estrum.

PREPARATION OF THE VACCINE

Four strains of the abortion organism were used in making up this suspension. Two of these, A and 80, were old laboratory bovine strains which grew very rapidly and heavily on culture media. One was a strain recently obtained from live-abortion-germ vaccine, put out by a commercial firm in this country, and the fourth, 101, was a strain recently isolated in this laboratory from an aborted bovine fetus. The cultures were grown on glucose-glycerine bouillon and glucose-glycerine agar, the growth on the latter being washed off and used to enforce the bouillon cultures. Subcultures were made and smears stained from each of the flasks which showed them to be pure cultures of the organism. All of the strains were known to be pathogenic for guinea pigs. The suspensions of the organisms were tested with a silica comparator standard, using Pear's precipitated fullers' earth so that it contained four billion organisms per cc. The

technique of this preparation is given in the turbidity standard of the "Standard Methods of Water Analysis," by the American Public Health Association, as used by Butterfield and Neill⁷ in the Hygienic Laboratory in their work on various strains of meningococci.

EFFECTS OF THE VACCINATION

The day following the injection a cold rain storm started and lasted four days. Practically all of the animals had a more or less marked reaction, probably exaggerated by the bad weather conditions. They stood about humped up in the pasture and ate very little. Alfalfa hay was being fed to them at the time. By February 11, 1922, they were all eating normally and on the following day the weather had cleared and they appeared to have recovered from the effects of the vaccination. However, local swellings were present at the point of injection in all of the animals. In the majority of cases these increased in size over several weeks and involved the prescapular lymph gland on that side in a number of the cattle.

On March 10th, the following condition was found on examination of the point of injection of the vaccine in these animals:

- No. 3219—Normal.
- No. 407-A—Normal.
- No. 418-A—Enlarged gland, $3\frac{1}{2}$ ".
- No. 410-A—Enlarged gland, $2\frac{1}{2}$ ".
- No. 2182—Large abscess.
- No. 4-A—Large abscess. Opened naturally. Material was taken for cultures.
- No. 429-A—Large abscess. 6" x 4". Opened.
- No. 2305—Gland slightly enlarged.
- No. 402-A—Had opened naturally.
- No. 2321—Normal.
- No. 2318—Enlarged gland.
- No. 434-A—Had opened naturally.
- No. 405-A—Normal.
- No. 403-A—Normal.
- No. 415-A—Small abscess.
- No. 408-A—Gland enlarged and hard.
- No. 406-A—Enlarged gland.
- No. 424-A—Enlarged gland.
- No. 414-A—Soft abscess.
- No. 404-A—Gland enlarged, 2" x 2".
- No. 25-A—Large soft abscess, 4" x 6" x 3". Opened by incision and material taken for cultures.
- No. 2314—Had opened naturally.
- No. 426-A—Had opened naturally.
- No. 433-A—Slight swelling.
- No. 2297—Enlarged gland.
- No. 2313—Had opened naturally.
- No. 2315—Enlarged gland.
- No. 413—Enlarged gland.
- No. 419-A—Enlarged gland.
- No. 421-A—Had opened naturally.

The animals at the time were not in nearly as good condition as the fourteen controls in Group II. The pus from the abscesses was identical in all cases, being thick yellowish-white in appearance. It was obvious that it had been caused by the inoculation. This condition probably would have been avoided to a considerable extent had the injection been made in several areas, instead of placing the entire twenty-cc dose at one point. Pus was collected from the abscesses on Cows 4-A and 25-A. Cultures made from this material on cooked-blood agar and fetus media developed pure cultures of *Bacterium abortum* from Cow 4-A and *Bacterium abortum* with some contamination from Cow 25-A. Blood samples were taken from these animals on February 21, 1922, and all gave a positive reaction to the agglutination test.

ONE ANIMAL VACCINATED WHEN PREGNANT

At the time of the vaccination, one of the dairy heifers, No. 2318, was pregnant, but it was not known, although later, when a diagnosis of pregnancy was made, a history was obtained of her having had opportunity to be bred by the dairy bull. She was vaccinated while pregnant and later aborted before the infectious material was given, finally going into Group III, and will be discussed later.

BULLS CHANGED FROM GROUP II TO GROUPS I AND III

On April 10, 1922, sixty-two days after the vaccination, the bulls were taken from Group II and started to breed the animals in Groups I and II. In Group II animals Nos. 2060 and 401-A were pregnant when the experiment started. During the sixty-two-day period eight of the remaining eleven became pregnant. Nos. 183, 2317 and 430-A did not become pregnant and were later bred to the dairy bull, conceiving without difficulty. It is quite probable that they did not come in estrum during the sixty-two-day period, as feed conditions in the pasture were not very good and the weather was cold and rainy. Except for the one night of April 10, 1922, the bulls were kept corralled in order to hand-breed the animals in Groups I and II, so as to have the breeding dates. The animals in these groups, although they had apparently entirely recovered from the effect of the vaccination, came in heat slowly. The following breedings took place:

Bull 412-A—Bred on April 18, 1922, to No. 433-A.
Bred on April 19, 1922, to No. 4-A
Bred on April 20, 1922, to No. 2314
Bred on April 20, 1922, to No. 403-A

	Bred on April 22, 1922, to No. 408-A
	Bred on April 23, 1922, to No. 2297
	Bred on April 26, 1922, to No. 421-A
	Bred on April 27, 1922, to No. 428-A
	Bred on April 27, 1922, to No. 2182
	Bred on May 3, 1922, to No. 410-A
	Bred on May 11, 1922, to No. 424-A
Bull 411-A—	Bred on April 21, 1922, to No. 25-A
	Bred on April 27, 1922, to No. 407-A
	Bred on April 27, 1922, to No. 406-A
	Bred on April 29, 1922, to No. 414-A
	Bred on April 29, 1922, to No. 434-A
	Bred on May 1, 1922, to No. 418-A
	Bred on May 19, 1922, to No. 405-A

When the breeding was started all of the animals were placed in the east pasture, where there was good green feed, and after they were bred they were removed to the road pasture.

HISTORY OF HEIFER 2318 VACCINATED WHEN PREGNANT

On May 12, 1922, on account of the animals breeding slowly, seventeen only having been bred and time being an important factor, due to the control animals being pregnant, a rectal examination was made of the thirteen unbred animals, the ovaries were massaged and the corpora lutea expressed from Nos. 426-A, 404-A, 405-A, 419-A and 420-A. At this time No. 2318 was found to be about five months pregnant, and in looking up her history it was recorded that she had been in the dairy pasture where the dairy bull was given exercise in December, 1921, prior to going into the experiment. She was, therefore, turned out with the bred heifers, although she had been vaccinated on February 7, when about two months pregnant.

On May 18, in the morning, the unbred heifers in the east pasture got through an open gate into the road pasture with the unbred heifers of the same groups. While the attendant was arranging gates in the corral, where the animals had been brought with the bulls prior to separating them into bred and unbred groups, Bull 412 was observed to breed this heifer and she was found to have a vaginal discharge. The laboratory was notified and upon making a rectal examination the uterus was found to be empty. The hand could be easily passed into the vagina and it contained a muco-purulent material streaked with blood, a handful of which was withdrawn and placed in a sterilized tube. The cervix was open sufficiently to admit two fingers. On massaging the uterus per rectum with the other hand in the vagina, cupped over the cervix, some shreds of tissue with blood clots were expressed from it and placed in a second sterile tube. An effort was made to demonstrate *Bacterium*

abortum by microscopic examination, but it was poor material to use for this purpose and the organism could not be demonstrated. Two guinea pigs, Nos. 2221 and 2222, were injected intra-abdominally with a salt solution suspension of the tissue, but both were found to be normal when killed and examined August 2, 1922.

This animal had definitely aborted between May 12, when she was found to be five months pregnant, and May 18, when she was seen to accept service from the bull. During this period the unbred heifers were being corralled twice daily with the bulls, but the bred heifers were not being closely watched. No evidence of the aborted fetus or membranes could be found on a careful search of the road pasture but this was to be expected as the area is hilly and covered with brush growth in some places. Small predatory animals, including coyotes, infest the area. In examining for pregnancy May 12, a rectal examination only was made. We therefore feel that abortion in this case was due to the vaccination.

This animal was continued in the experiment, later becoming a part of Group III. She did not become pregnant to the service on May 18, but after she became a part of Group III, on June 24, 1922.

CHANGING OF GROUPS PRIOR TO INFECTION

On June 24, 1922, ten animals in Group II were examined per rectum and found to be definitely pregnant. These constituted the controls in this group to receive infection. The other three, Nos. 183, 430-A and 2317, not impregnated during the period from February 7 to April 10, and not exposed in any way to infection, had been removed to the dairy pasture to be bred as previously mentioned and later returned with Nos. 2298 and 436-A to constitute the five uninfected controls or association animals of Group II.

Twenty bred heifers of the thirty vaccinated animals were separated to constitute Group I. They were examined for pregnancy but some of them had been too recently bred for this to be of any value. The result of this examination is given in the following list:

No. 434-A.....	Bred April 29	Pregnant
No. 2314.....	Bred April 20	Pregnant
No. 2305.....	Bred May 25	?
No. 414-A.....	Bred April 29	Pregnant
No. 408-A.....	Bred April 22	Pregnant
No. 433-A.....	Bred April 18	Pregnant

No. 424-A.....	Bred May 11	?
No. 2182.....	Bred April 27	Pregnant
No. 410-A.....	Bred May 3	Pregnant
No. 25-A.....	Bred April 21	Pregnant
No. 407-A.....	Bred April 27	?
No. 403-A.....	Bred April 20 and June 3	?
No. 4-A.....	Bred April 19	Pregnant
No. 428-A.....	Bred April 27	Pregnant
No. 418-A.....	Bred May 1	Pregnant
No. 415-A.....	Bred June 10	?
No. 421-A.....	Bred April 26 and June 3	?
No. 405-A.....	Bred May 19 and June 19	?
No. 426-A.....	Bred June 24	?
No. 404-A.....	Bred June 20.	?

A rectal examination only was made, as most of them were heifers and to get the hand into the vagina was difficult or impossible. We also hold the opinion that, under certain unrecognized conditions, bimanual examination in a small percentage of cases may be the cause of abortion. (See Article III, Bulletin No. 353, of this Station).

Of this group Cows 405-A, 415-A and 428-A were later found not to have been pregnant. No. 428-A, on June 24, was thought to be pregnant, having been bred on April 27, fifty-eight days prior to the examination. It is thought, however, that this diagnosis of pregnancy was an error, rather than that she aborted, as she was being daily observed with other animals in the group and was seen to be in heat on August 5.

The ten pregnant control animals to receive infection were taken from the far-east pasture and placed with the twenty animals in Group I in the corral. The ten remaining vaccinated animals constituting Group III were then placed in the far-east pasture, which up to this time had not contained any infected animals. They were left in this pasture for the remainder of the experiment, thus being kept free from any infection except that given them by the vaccination on February 7, 1922. At this time only one of them, No. 413-A, was pregnant. Both bulls were placed in the pasture with this group.

The thirty animals, constituting the entire twenty head of Group I and the ten controls to receive infection in Group II, were kept corralled from June 24 to June 26. This was done with the object of controlling their water supply, expecting they would drink from the watering-trough the infectious material to be given them on the later date.

PREPARATION OF THE INFECTIOUS MATERIAL

Eight gallons of milk were received from the University Farm, Davis, from cows in experiments being carried on by Hayes

and Barger and known to contain *Bacterium abortum* in their milk. To test this particular milk 800 cc were centrifuged and the sediment inoculated intra-abdominally into the guinea pigs Nos. 2334 and 2335. No. 2334 died on July 13 but was not autopsied. No. 2335 was killed August 24 and on autopsy found to have extensive lesions of abortion. Its blood gave a positive agglutination test.

The following material from bovine fetuses, which had been received at the laboratory and found to contain *Bacterium abortum*, was mixed in salt solution to a volume of one gallon:

Fetus Number	Lungs	Stomach Contents	Intestinal Contents	On Ice Since
32	x	x	x	May 13
33	x			May 30
35	x	x		May 25
37	x	x		June 1
38	x	x		June 12
40	x	x		June 15

A bottle, capacity one gallon, was used to contain 1250 cc of glycerine-glucose-broth culture of *Bacterium abortum* strain 4-A. Also, the surface growth of strain 80, on thirteen bottles of glycerine-glucose agar, washed off with salt solution. Strain 4-A was isolated from the abscess of Cow 4-A following vaccination and 80 was an old laboratory bovine strain.

Another gallon bottle was used to contain 200 cc of broth culture of strain 118, isolated in this laboratory March 10, 1922, from fetus 18.

A third gallon bottle was used to contain surface growth on fetus-media agar, washed off with salt solution, of strains of *Bacterium abortum* recently isolated from fetuses 10, 20, 35, 37, 38 and 40.

A fourth gallon bottle was used to contain strains of *Bacterium abortum* on solid and liquid media isolated from guinea pigs inoculated with tissues of infected fetuses Nos. 3, 10, 11 and 18.

There was thus a mixture of eight gallons of infected milk, one gallon of infected fetus tissues in salt solution, and four gallon bottles containing cultures and filled to a gallon volume with water at the time of the infection, 6:30 to 9:30 p. m., June 26, 1922.

METHOD OF INFECTING THE ANIMALS

The evening was foggy and the infection was delayed until late in the day in order that the material would not be exposed to strong light during the process. An effort was made to mix the material in the drinking water and have the animals drink

it from the trough. On account of discoloration of the water from the milk and a slight odor from the fetus material, the animals would not drink although they had had little water for the previous forty-eight hours. They were then placed in the chute and drenched. The drenching mixture was made by taking 500 cc from each of the five one-gallon bottles and 500 cc of milk, making a total of 3000 cc, of which mixture each cow was drenched with one pint. The remainder of the infectious material was placed in the watering-trough, baled alfalfa hay opened and the flakes soaked in the trough until the solution was all absorbed. It was then spread around the corral for the animals to eat. They had not been previously fed on that day and no difficulty was experienced in getting them to eat the hay. The following morning the animals were turned into the east pasture, the watering-trough disinfected and no further exposure to infection was given. Fourteen days later, on July 10, blood was drawn from these animals and all ten of the controls, which up to the time of infection, on June 26, gave a continuous negative reaction, now showed a positive reaction indicating they had been infected with *Bacterium abortus* by the method used.

SUBSEQUENT HISTORY OF ANIMALS IN GROUP II

Six of the ten animals aborted from fifty-eight to eighty-eight days following the infection. No. 2060 calved normally ten days afterwards, which was too soon for infection of the uterus to have taken place. No. 401-A calved twenty-seven days after the infection. The calf was weak but lived. The placenta was retained and on removal and examination abortion organisms were found in great numbers in smears and cultures. They were present also in the colostrum. The existing pregnancies of Nos. 2312 and 26-A were apparently not affected by the infectious material and both animals calved normally on the same day, one hundred and sixty-two days after the infection. The examination of the agglutination reaction of these animals showed quite definitely that they became infected, but overcame it and remained entirely negative to the agglutination test.

Two animals in this group, Nos. 2060 and 401-A, were much further advanced in pregnancy at the time of infection than any animals in Group I. The six animals that actually aborted, however, were only about one month further advanced than a number of animals of Group I. The bulls were with these animals from February 7 to April 10 and then turned with Group I, a

number of which were bred during that month. We do not think, therefore, that this difference in the period of gestation had any marked effect on the results obtained.

SUBSEQUENT HISTORY OF ANIMALS IN GROUP I

All of the seventeen animals in this group that became pregnant carried their calves to term except No. 407-A which was accidentally killed in the last month of gestation. In this animal the pregnancy was progressing normally and no evidence of abortion infection could be found in her tissues, the examination of which will be discussed later.

The following examination was made of the fetus from cow 407-A accidentally killed:

Fetus—Black and white, female, normal, eight months gestation.

Dam—407-A. Fetus was removed from uterus after death of dam, due to broken neck.

Externally—Fetus was normal.

Internally—Tissues normal.

Heart—Few petechial hemorrhages on myocardium of ventricles.

Stomachs—Distended with a viscid, faintly-clouded fluid, which showed no evidence of being stained with meconium.

Rectum—Meconium made up of firm, mucous-coated pellets, greenish in color.

Cultures were made from—

Heart-blood—Negative.

Lung—Negative.

Liver—Negative.

Spleen—Negative.

Stomach contents—Negative.

Small intestine—Negative.

Meconium (rectum)—Negative.

Blood serum of the calf was negative.

Smears were made from stomach contents—Negative.

Guinea pig 2783—Injected with stomach contents. Killed February 12, 1923—Negative.

Guinea pig 2774—Injected with extract of the lung, liver and spleen. Killed February 13, 1923—Negative.

All of the animals in this group passed the placenta normally except Nos. 433-A and 2305. The former animal calved at 9 a. m. and as the placenta was desired for examination, it was manually removed at 11 a. m. Some of the cotyledons in the apex of the pregnant horn were markedly adherent. This after-birth, however, might have passed normally had more time been given.

No. 2305 calved at 11 a. m., with assistance from the attendant, after having been in labor since 7 a. m. This was a small heifer and the calf was large and expelled dead. Post-mortem examination showed the lungs had not been inflated. While it was an anterior presentation, death may have occurred during parturition or may have resulted from inflammation of the placenta

which was present. The following day at 11 a. m. part of the placenta was protruding from the vagina and was torn off and placed in a sterile can by the attendant. At 2 p. m. more was protruding from the vagina until it nearly reached the floor. On removing this and making an examination of the inside of the uterus, parts of it were still found adherent to the maternal cotyledons and there was considerable discharge from the uterus. This was, therefore, a definite case of retained placenta. Three days later the heifer was again examined and shreds of the placenta were still attached to the uterus.

The first two guinea pigs inoculated with placental material died in forty-eight hours. Two others were then inoculated with uterine exudate. One of these also died in forty-eight hours but the other lived. This latter was finally killed at the end of six weeks and was negative for *Bacterium abortum*.

Laboratory examination of calf born dead, from dam No. 2305:

Color—Black and white. Sex—Male.

Calf was expelled dead 11 a. m., February 27, 1923.

Calf was apparently mature and well developed.

Calf brought to laboratory 2 p. m.

Post-mortem:

Externally—Calf normal.

Internally—Tissues appeared normal.

Heart—Base of ventricles heavily spotted with petechial hemorrhages.

Lungs—Normal, not inflated.

Liver, spleen and kidney—Normal.

Stomachs—Filled with a clear mucus which was normal.

Intestines—Showed normal meconium.

Bacteriology:

Heart-blood—Negative.

Lung—Negative.

Spleen—Negative.

Liver—Negative.

Stomach contents—Negative.

Small intestine—Negative.

Large intestine—Negative.

Meconium (rectum)—Negative.

Guinea pig 2883—Extract from lung, liver, spleen. Killed April 15, 1923. Negative.

Guinea pig 2884—Stomach contents. Killed April 15, 1923. Negative.

Smears: Lung—Negative. Stomach contents—Negative.

The only other calf deserving mention was from No. 418-A. This calf was expelled with the placenta and the umbilical vessels remained intact. Birth occurred about 5 a. m. and the attendant was not present until 6 a. m., when the calf was found as described. It was alive, but very dull. The umbilical vessels were severed and the calf died about one-half hour later.

Laboratory examination of calf, which died soon after birth, from dam 418-A:

Color—Black and white.

Sex—Female.

Born—February 2, 1923.

Post-mortem:

Externally—Calf normal.

Internally—Tissues appeared normal.

Lungs—Perfectly inflated.

Stomachs—Filled with a faintly-clouded mucus, which was apparently normal.

Intestines—Showed normal meconium.

Cultures were made from the following:

Heart-blood—Negative.

Lung—Negative.

Spleen—Negative.

Liver—Negative.

Stomach contents—Negative.

Small intestine—Gram-negative, slender rod. *Bact. coli.*

Meconium (rectum)—Negative.

Blood serum—Negative.

Guinea pig 2897—Extract from lung, liver, spleen. Died February 13, 1923. *Bact. coli.* in heart-blood. Lungs congested.

Guinea pig 2898—Stomach contents. Killed March 19, 1923. Negative.

The colostrum for injecting the guinea pigs was obtained in sterile, quart jars immediately after calving. From a few hundred cc to one liter was taken in each case, some being collected from each of the four teats. This was brought to the laboratory and centrifuged in 100-cc centrifuge tubes for twenty minutes. Some of the fat from the surface of one tube and the sediment in the bottom of same were mixed together and one cc injected intra-abdominally into each guinea pig.

The entire placenta, or as much of it as could be collected in each case, was placed in a sterile, covered, one-gallon can and brought to the laboratory. In case it was soiled with manure or bedding it was washed in tap water. Following this it was spread out on a tray and a careful examination made of the cotyledons for any evidence of necrotic, hemorrhagic or other abnormal areas. Material for guinea-pig injection was always taken from the most suspicious looking areas. Parts of the tufts of several cotyledons were removed with scissors, ground up in a mortar with sterile salt solution and 1 cc of the material injected intra-abdominally into each guinea pig.

Stained smears from the cotyledons were also examined microscopically in each case.

It will be observed that all of these placentae were negative for *Bacterium abortum*, while samples of the colostrum from four of the animals contained the organism. This would suggest that vaccinated animals are not very liable to expel the organism from the genital tract at parturition following vaccination.

These experiments confirm the fact that in persistent carriers, the udder is the seat of such infection. No conclusion can be drawn, however, as to whether the udder infection in these four cases resulted from the vaccination or from the infection by ingestion.

ASSOCIATION ANIMALS OF GROUP II

The five animals constituting the uninfected controls in Group II consisted of Nos. 183, 430-A, 2317, 2298 and 436-A. The first three of these animals had been with Group II in the far-east pasture, while they were being bred from February 7, 1922, to April 10, 1922, but did not become pregnant. The bulls were removed from this group on April 10 and used to breed animals in Groups I and III until June 24, 1922. On May 3, 1922, No. 183 was in heat. She was moved to the dairy, bred to the dairy bull and conceived. At this time Nos. 2317 and 430-A were also taken to the dairy for breeding. On July 25, 1922, No. 183, then definitely known to be pregnant to the service of May 3, and No. 2298, a pregnant dairy animal, were added to Groups I and II. August 10, 1922, No. 2317, then definitely pregnant to the dairy bull, and No. 430-A, recently bred to him, were also added. This group was still one animal short and No. 436-A, which had been purchased in August, with eleven animals of Group IV, and known to be in early pregnancy at the time, was added on September 26, 1922. The abortions in the ten infected controls of Group II actually took place between August 21, 1922 and September 20, 1922. All of the uninfected controls were in direct association with these animals during all of the period except No. 436-A, which was added five days after the last actual abortion occurred. All of these five association animals carried their calves to term. Guinea pigs were inoculated with colostrum and placenta from each animal, and *Bacterium abortum* was found in the placenta of No. 183 and in the colostrum of Nos. 2298, 2317 and 430-A.

In studying the agglutination tests of these animals it is interesting to note how the agglutination titre of No. 2298 gradually increased and that of No. 183 remained entirely negative. This latter animal furnishes another example of how the agglutination test may fail to detect a spreader of the organism. No. 430-A gave very slight indication of reaction to the agglutination test and No. 2317, although showing much better evidence of infection in the tests made November 10, 1922 and March 23, 1923, did not at any time develop a definitely positive reaction.

SUBSEQUENT HISTORY OF ANIMALS IN GROUP III

In regard to these animals it should be understood that they were vaccinated on February 7, 1922, with the twenty animals in Group I. They were associated with this group during the sixty-two days following vaccination to April 10, 1922, and also during the breeding period of these groups from April 10, 1922, to June 24, 1922, two days before the infection of Group I and the ten infected controls of Group II. On June 24, 1922, an effort was made to get twenty bred animals from the thirty head to make up Group I, so that the infection experiments could proceed. Only seventeen head of the twenty so selected were actually pregnant, although all twenty had a definite history of having been bred. Of the ten head remaining, which went into Group III, only one was pregnant at the time, No. 413-A. When the bulls were taken from Group II and started to breed the animals in Groups I and III, on April 10, they were allowed in the pasture with the animals for that one afternoon and night, after which they were kept corralled in order to have breeding dates. This heifer was bred at the time but the fact was not recorded.

The animals in this group were transferred to the far-east pasture with both bulls and the latter were left with them from June 24 to September 26, 1922. At that time they were examined, and only four, Nos. 2321, 2318, 2297 and 413-A, were found to be pregnant. Since not all the animals were pregnant, bull 411 was left with them, but No. 412 was removed and added to a fourth group not covered by this report.

The animals in Group III were again examined on November 20, 1922, and the above four were the only ones that were pregnant. They were all in good condition for animals on range at that time of the year. They were again examined on December 29, 1922, with the same result.

On February 5, 1922, bull 411-A was in poor condition. He was removed from the group and added to the pregnant animals in Groups I and II, which were corralled around the buildings, so that he could be fed hay. Bull 412, which had been with five heifers in Group IV, was in very good condition and was added to Group III.

One week later, bull 412 jumped the fence from the far-east to the east pasture and bred cow 20-A, an infected control in Group II, which had aborted on September 10, 1922. On that

date both bulls were corralled in a special corral built for them in the connecting pasture. (Figure 1).

The animals in Group III had been in continuous association with one or both bulls from April 10, 1922, to February 12, 1923, a period of approximately ten months, and only four of the ten had become pregnant, as shown by an examination of the group for pregnancy on February 26, 1923. From February 12 to May 1, 1923, when no bull was in the pasture with these animals two were seen to be in heat and were corralled and bred to bull 412 as follows: No. 2315 on April 29, and No. 2313 on May 9.

The far-east pasture in which these animals were kept is large, rough and mountainous with considerable brush growth on the hillsides. They were not, therefore, under very close observation during all of this period. It would have been possible for them to have become pregnant and aborted without being observed. We do not feel, however, that this occurred, because of the repeated negative examinations for pregnancy made during the period. It is also improbable that abortions occurred in any of the six animals before a diagnosis of pregnancy was made and did not occur in any of the four animals in which pregnancy was early diagnosed. The results obtained with the animals in Group I further substantiate the improbability of any of these animals having aborted.

The peculiar result in Groups I and III is that of the thirty vaccinated animals only twenty-one were successfully impregnated. Six of the nine which did not become impregnated were constantly in association with one or two bulls for nearly a year; the other three for the period from April 10 to June 24, 1922. Practically no difficulty was experienced in getting the control animals bred. All of the animals that failed to get with calf had never been pregnant and they were the youngest heifers. The only difference in the treatment of these animals from the others is that they received an injection of living *Bacterium abortum* organisms. Continued effort will be made to get these animals with calf. However, if the vaccination was the cause of this condition it should be considered a serious result of its application. Thirty per cent of non-breeders in vaccinated animals would materially offset the value shown by the treatment to prevent abortion in the injected animals that did become pregnant. The four animals in this group which became pregnant calved normally, No. 413-A on January 17, Nos. 2297 and 2318 on April 6, and No. 2321 on May 14. Guinea pigs injected with

colostrum and placenta extract from these animals showed no evidence of abortion infection.

STUDY OF BODY TISSUES FOR PRESENCE OF BACTERIUM ABORTUM IN VACCINATED ANIMALS

To date complete bacteriological examinations, including guinea-pig inoculation for the presence of *Bacterium abortum*, have been made of the tissues of five vaccinated animals. Three were from Group I and had been vaccinated and infected, and two from Group III, one of which had been exposed in no other way except by vaccination.

The bacteriological examination showed that all of the cultures and guinea pigs inoculated from the tissues of these five animals were negative for *Bacterium abortum*. The colostrum of No. 421-A was positive for *Bacterium abortum* at the time of calving, March 6, 1923. This fact was not known at the time of slaughter, March 23, but only after the guinea pigs inoculated with her colostrum at time of calving were killed on April 25, 1923. At time of slaughter a sample of milk or part of the udder was not taken, but the supramammary lymph glands were removed and from them cultures made and one guinea pig inoculated. She must, therefore, be considered as an animal having infection in the udder only.

DISCUSSION

A study of the data on the forty-five female animals in Groups I, II and III shows evidence favorable, as well as unfavorable, to the field use of live-abortion-germ vaccine.

The favorable evidence consists in the fact that the seventeen vaccinated animals in Group I that became pregnant all carried their calves to term except one which was accidentally killed in the last month of gestation and in this case the pregnancy was progressing normally. These animals were subjected to the same infection by ingestion as the ten pregnant animals in Group II, six of which aborted in from fifty-eight to eighty-eight days following the exposure, one calved too soon for infection of the uterus to have taken place and one calved with infection of the uterus present but pregnancy terminated before abortion could have occurred.

An examination of the placentae of the seventeen pregnant animals in Group I showed no evidence of *Bacterium abortum*. The organism was, however, found in the colostrum of four of the animals.

A rather complete bacteriological examination, including guinea-pig injection, of the tissues of three of the animals of this group (one of which died and two of which were killed) failed to show the presence of the organism in their bodies. There may be some question as to whether the technique of this search was sufficiently elaborate.

No. 421-A a few weeks prior to slaughter had shown the presence of the organism in her colostrum. The tests of her blood, however, and also that of No. 424-A were showing a diminution in the amount of agglutinins present as evidenced by an entirely negative reaction in dilutions above 1-25.

No. 407-A, the animal that was accidentally killed, was a very positive reactor to the agglutination test in all four dilutions. On the two tests previous to her death, there was no agglutination in the last tube and blood taken after death on December 28, gave a negative reaction in the last two tubes.

Methods for recovering *Bacterium abortum* similar to those used in these cases have been successful in isolating it on a number of occasions in our laboratory.

The four animals in Group III which were exposed to infection only by vaccination, calved normally and no abortion organisms were found in the placentae or colostrum. One of these animals, No. 2318, was vaccinated while pregnant, February 7, 1922, aborted between May 12 and May 18, 1922, conceived again shortly after June 24, 1922, and calved normally April 6, 1923. At the time of abortion, the fetus and placenta were not available. The uterine discharge, however, failed to show any abortion organisms. Two, Nos. 413-A and 2297, were killed some weeks after calving. A rather complete bacteriological examination, together with guinea-pig injection, of their tissues failed to show any evidence of the presence of *Bacterium abortum*. This would tend to show that animals at the time of parturition following the vaccination are not eliminating the organism from the genital tract. When vaccinated and infected, they are not nearly as liable to be spreaders at the time of parturition as is the case with the unvaccinated infected and association animals.

The unfavorable evidence in this series of experiments is the fact that of the thirty vaccinated animals, only twenty-one became pregnant. No reason for the failure to get with calf of the other nine, constituting 30 per cent of the animals, can be

given except the vaccination. Should this be the case generally with vaccinated heifers, it would mean a serious loss.

Following the vaccination, local swellings developed in all of the animals, many of them resulting in abscesses, which broke and discharged pus. This material contained *Bacterium abortum* in large numbers. While vaccination may be carried out with a much lower incidence of abscess formation than occurred with our experiment cattle, when it does occur it must be assumed that the organisms will be spread for weeks with the discharge from such areas.

In this experimental work, the groups were handled under artificial conditions in order that all of the animals might be vaccinated at one time. This would not prevail under practical conditions in the field, and, in the average dairy, to get all the breeding animals vaccinated would require the greater part of a year.

Once abortion appears in a herd, the pregnancies of the remainder of the animals are liable to be terminated prematurely by infection. Vaccination cannot be carried out until the uterus is empty. In this respect the vaccine differs from other biological products which can be used on all the exposed animals at once. This condition limits its field of usefulness at best and brings out clearly the need for the application of other measures when practicable. Among such should be mentioned the application of the agglutination or complement-fixation test and removal of reactors where the percentage of infection is small, or a plan of isolation at time of parturition or abortion and disinfection where it is not practicable to remove reactors.

The fact that the four of the five association animals that became infected were all exposed during the actual abortions in the control group, while the one which was not added until five days after the last abortion failed to pick up the infection, is significant. All of these four association animals carried their calves to term, which is evidence that, under natural infection, the period of time required for the production of abortion is longer than when massive infection is given artificially.

The evidence tends to show that in the production of immunity in this infection, it is not necessary to have permanent multiplication and activity of the organism in the animal body and that immunity is conferred as a result of the animal having been infected with cultures of the causative agent. This immunity, however, does not necessarily destroy all of the organisms

in the body and the point where infection will most likely remain is the udder.

These experimental animals are being carried through a second pregnancy at present and further data on the duration of the immunity will be accumulated.

CONCLUSIONS

The above experiments clearly demonstrate the value of living cultures of *Bacterium abortum* in preventing abortion in the vaccinated animals when subjected to identical infection that produced abortion in the controls.

Nine of the thirty vaccinated animals have to date failed to conceive. No other explanation can be offered for this sterility except the vaccination.

The ability to produce abortion in susceptible animals by a single exposure to infectious material given by ingestion was demonstrated. The abortions in these cases occurred from fifty-eight to eighty-eight days after the infection.

Although the animals in Group I did not abort, the immunity was not sufficient in all cases to prevent *Bacterium abortum* from remaining viable in their bodies as shown by its demonstration in the colostrum of four of the animals.

Bacterium abortum has not been recovered from the placentae or colostrum of these animals of Group III which did become pregnant and which were subjected to vaccination only. When suppuration develops as the result of the vaccination, the organism will be found for many weeks in the discharge from such areas.

REFERENCES

- ¹ Bang, B. Die Aetiologie des seuchenhaften (infectiosen) Verwerfens. Zeitsch. f. Thier. Med., Vol. 1 (1897), p. 241.
 - ²McFadyean, Sir John and Stockman, Sir S. Report of the Departmental Committee Appointed by the Board of Agriculture and Fisheries to Inquire into Epizootic Abortion. App. to Part III, Abortion in Sheep (1913), p. 22.
 - ³Idem. Report of the Departmental Committee Appointed by the Board of Agriculture and Fisheries to Inquire into Epizootic Abortion. App. to Part I, London, 1909.
 - ⁴Hadley, F. B. Results from Immunizing Cattle against Abortion. Jour. A. V. M. A., n. s., Vol. 13, No. 1 (October, 1921), p. 26.
 - ⁵Huddleson, I. F. Studies in Infectious Abortion. Jour. A. V. M. A., n. s., Vol. II. No. 5 (February, 1921) p. 524.
 - ⁶Schroeder, E. C. Bureau of Animal Industry. Investigations on Bovine Infectious Abortion. Jour. A. V. M. A., n. s., Vol. 13, No. 5 (February, 1922), p. 542.
 - ⁷Butterfield, C. T. and Neill, M. H. Differentiation between Various Strains of Meningococci by Means of the Agglutination and the Absorption of the Agglutinins Tests. Hygienic Laboratory Bulletin No. 124, Part I, November, 1920.
- (In the publication of this paper the following tables have been omitted:
- I. Agglutination Tests on Blood of Experiment Cattle from August, 1921, to May, 1923.
 - II. Parturition History of Ten Controls in Group II, Following Infection by Ingestion, June 26, 1922.
 - III. Breeding and Calving Dates of Experiment Animals with Results of Guinea-Pig Inoculations for the Presence of *Bacterium Abortum* in the Placentae and Colostrum.
- It was also found necessary to omit the protocols of the bacteriological examination of the body tissues of the five vaccinated animals referred to on p. 55.
- The paper in full, with all tables and protocols of experiments, will be published as a technical bulletin by the University of California, in the near future.—EDITOR.)

DISCUSSION

DR. E. C. SCHROEDER: Mr. Chairman, Dr. Hart told us of two animals that were killed and their bodies searched afterwards for abortion bacilli, but he did not tell us what the result of the search was.

DR. HART: Five of the animals were killed; one died. In these animals which were killed, all of the lymph glands were removed, cultured and injected into guinea pigs. In some the uterus was used and in some of them the udder. They were all negative for *Bacterium abortum*.

DR. W. L. WILLIAMS: Mr. Chairman, I do not get very clearly from Dr. Hart regarding the breeding of these animals. The chart shows that the bulls were turned into the pasture, and yet from something he said it would appear that they were turned with the cattle under direct observation, so that he knew whether copulation occurred or not. It is also stated, by Dr. Hart, that the controls which he selected were taken out of Group I, after they had failed to conceive, but it is not clear that they had copulated.

It has been my observation, taking a large group of animals, that one may foretell to a considerable degree the ratio of abortion by the number of copulations necessary for pregnancy. So, I would like to have some additional information, if Dr. Hart can give it, upon that point.

Regarding the summary presented, Dr. Hart did not give us any particular conclusion, but left the facts with us with reference to the influence of vaccination with living abortion bacilli. As I figure the results—and Dr. Hart will correct me if I have erred—in the vaccinated group, including Groups I and III, consisting of thirty animals, there were nine failures to conceive, amounting to thirty per cent of sterility, and in the fifteen other animals which were not vaccinated, there were six abortions. In other words, in the vaccinated group there was a ratio of seventy calves per one hundred cows, and in the unvaccinated group a ratio of sixty calves per one hundred cows, giving an advantage to the vaccinated group of ten per cent.

We also keep cows for milk. The forty per one hundred which aborted probably gave twenty-five per cent of the ordinary milk-flow. That is a mere guess which may be right or wrong, which would add about ten per cent of the normal milk-flow to the entire group. That would make seventy per cent of the ideal flow of milk in both groups; that is, it would give essentially the same yield of milk in the two groups.

We have, however, the two groups remaining, with some exceptions which have been destroyed, and we have a certain outlook regarding the future usefulness of these animals. From a reproductive standpoint the ten sterile heifers are dead. It might be that a few of those would conceive if kept over for another year; some of them may be pregnant now for that matter, but speaking generally, a heifer which has failed to breed for a year is reproductively dead. If ten sterile heifers are kept for one year, and two or three of them finally produce one living calf each, the cost of keep of the ten far outweighs the gain.

In the other group, however, where we had the forty per cent of abortion, the maximum prospect for conception is one hundred per cent. In the group which was vaccinated, the maximum prospect for breeding is seventy per cent. So that the maximum estimate to be placed upon the value of the animals, as they remain at the time that the experiment is reported, according to my computation, is thirty per cent in favor of the non-vaccinated animals; that is, we have a prospect of one hundred per cent pregnancy in the one and a prospect of seventy per cent of conception in the vaccinated animals.

That seems to me to indicate, unless some additional explanation is made, that the use of living cultures is a very great detriment and a danger to the cattle industry. This large volume of sterility is in harmony with all other reports regarding this subject which we can find. That is true in the Bland report, where the sterility and abortion, taken together, amount to about the same sum in both vaccinated and non-vaccinated. (Applause).

DR. E. A. WATSON: Mr. Chairman, if in a few words Dr. Hart could say something on the nature of the vaccine itself, it would be of interest. I gather that very massive doses were employed, owing to the local reactions of abscesses

and I am interested to know the dosage, the virulence of the culture, its age, and any method of standardization that was attempted.

DR. W. W. WILLIAMS: Mr. Chairman, I would like to ask a question of Dr. Hart as to what methods he employed in ascertaining whether the bulls used were healthy in other respects than that of infection by *Bacillus abortus*? Very commonly, in some breeding sections of the country, we find as many as fifty per cent of the bulls in a herd that are diseased and are unable to reproduce normally, which affects to a great degree the abortion rate.

Generally it may be stated that the fertility of the bull is not indicated by his agglutination test; that is, it has not been shown, as far as yet determined, that this has any great significance on his fertility and upon the health and vitality of the offspring which may come from him.

Another point which I think has never been clearly shown is whether there is an actual immunity produced in any case to *Bacillus abortus*. We hear of immunity being produced to abortion. Abortion is merely an act like sneezing and coughing and various other acts which cannot be very readily immunized against. Again, it is stated that in a number of these cases *Bacillus abortus* was obtained from the udder or other places in the immunized animal. That does not constitute true immunity; it is simply a relative immunity. I would like to ask the question whether there is a true immunity to bacterial invasion by *Bacillus abortus* produced and whether there is any evidence to this effect, any records which may have been given?

DR. EICHORN: I would like to ask the question of Dr. Hart, out of the nine sterile animals subjected to breeding, how many became pregnant, if any? Furthermore, as to the control group, out of the six aborting animals (I think the group contained eight) one aborted before the infection could be established and one from another cause. Out of these eight animals how many were successfully bred subsequently?

CHAIRMAN GOSS: If that is all, we will now listen to Dr. Hart's replies to these discussions.

DR. HART: In regard to Dr. Williams' question regarding the breeding dates of these animals, in certain groups of them we have the definite breeding dates; in others only the period between two dates when the bulls were in constant association with them. All of the animals that have definite breeding dates in the majority of cases conceived with one service. One of the animals which did not get pregnant was bred the last time on June 19, five days previous to the examination on June 24. We did not know, therefore, whether she was pregnant or not, but she had to go into this group because we wanted to proceed with the infection experiments.

The other animals were bred between February 7 and April 10 and we did not keep definite breeding dates. Therefore, we do not have the number of times those ten animals were bred to get with calf. The same occurred with four animals in Group III, and we do not know how many animals in that group of six were bred without getting a calf. We are now keeping them under observation and know how many of them have been bred and whether they got with calf.

To answer Dr. Eichhorn's question definitely, two of the animals in Group III are definitely with calf at this time and maybe some more of them, but there was a period of a year which elapsed without them getting with calf, which was of course at least a delayed impregnation period. Also three of the animals in Group II, which aborted, are now with calf.

Dr. Watson asked how these organisms were grown to make the vaccine. They were grown on glycerin-glucose broth and on glycerin-glucose agar, the growth on the agar being washed off to reinforce the bouillon culture, and we injected the animals with 20 cc of a 4,000,000,000 suspension, the 4,000,000,000 suspension being ascertained by using a comparator standard with Pear's precipitated fullers' earth, after the method recommended by the Hygienic Laboratory, in the production of antimeningococcic serum. We injected this entire dose at one point. Therefore, we had a very severe reaction at that one point. We disinfected the area with a 3% solution of cresol, as would be done in routine field practice, and then injected the 20-cc dose at one point. We got out of that the fact that as long as there is discharge from an abscess at the point of injection, there will be a discharge of *Bacterium abortum* from

the area, and they will be there in large quantities. There is no question, however, but what vaccination can be carried out with a much lower incidence of abscess formation than we had in our animals.

Dr. Williams asks what we did to be sure the bulls were free from other infections besides *Bacterium abortum*. These bulls were taken from a certified dairy, near San Francisco, which has been under our observation for many years, and these animals have been quite free from genital troubles. About five years ago there were a number of cases of retained after-birth, and last year the only difficulty was the presence of scours in the calves. The bulls were about fifteen months old at time of purchase, and we do not think they had been in service prior to the time we obtained them. Our work being largely directed toward the study of the effect of *Bacterium abortum* and not having any definitely established technique to ascertain the presence of other infections, we felt we had done all we could in getting bulls with this kind of a history and negative blood tests for *Bacterium abortum*.

In complete answer to Dr. Eichhorn's question, I would like to say that I am not one of those persons who considers himself one hundred per cent perfect in the diagnosis of pregnancy, and the diagnosis of pregnancy of the animals mentioned above in Groups II and III was made on August 11, and I believe those pregnant, which I have indicated; namely, Nos. 416-A, 429-A, 2181 in Group II, and 2313 and 2315, in Group III.

DR. EICHORN: The statement of Dr. Hart regarding the present pregnancy of the animals in Groups II and III entirely upsets the deductions made by Dr. Williams.

MULE PRODUCTION SHOWS INCREASE

The ability of mules to endure hardships and perform service under adverse conditions has established them firmly in American agriculture, which is shown by the fact that mules for farm work increased from 4,209,769 in 1910 to 5,432,391 in 1920, or nearly 30 per cent, according to Farmers' Bulletin 1341, Mule Production, just issued by the United States Department of Agriculture.

"There is a wrong and a right way to lead a mule," says the author of the bulletin. "A man who looks at a mule and lugs at his head will never make progress. The mule will not be pulled. He will usually follow quietly, however, if a man will walk away in the direction he desires to go. Neither can you "bully" mules into going through tight places; they are somewhat like sheep, and if the leader can be induced to go the rest will follow."

After telling how to handle mules the bulletin discusses the selection, care and feeding of jacks and mares for the production of mules; the weaning, care and education of mule colts; and gives a detailed description of the market classes—draft mules, farm mules, sugar mules, cotton mules and mining mules—with illustrations of choice, good and medium or common animals of each type. It may be obtained upon application to the United States Department of Agriculture at Washington, D. C., as long as the supply lasts.

THE TREATMENT OF CONVULSIONS IN DOGS¹

By E. L. QUITMAN, Chicago, Ill.

It is not my intention to enter upon a scientific discussion of this very broad and troublesome subject, but to treat, in an intensely practical manner, the therapeutic handling of the very common conditions spoken of as convulsions or fits.

Colics were the most common and troublesome conditions met with in horses and this causes me to study them and their therapeutics exceedingly closely and to arrive at a "standardized treatment," which is now well known and has given universal satisfaction.

For the same reasons mentioned in connection with colics of horses, I have given careful study to the subject of canine convulsions and have conducted exhaustive therapeutic experiments, extending over a number of years, and I believe that I am now able to give to the veterinary profession a "standardized treatment" that will give more pleasing results than any heretofore used.

CONVULSIONS CLASSIFIED

From a practical standpoint it might be said that convulsions are of two kinds, *i. e.*, those that arise from more or less removable causes and those that arise from causes which are not readily removed, such as infections and dietetic deficiencies.

The word "convulsions" is used here to cover every type and degree of fits from that type in which there is only a mild chattering or snapping of the jaws, accompanied by perhaps some frothy saliva, to the violent, tetaniform or epileptiform convulsions, or the furious type in which the animal barks furiously, runs wildly, jumps through a window and in other ways gives evidence of a furious delirium, rather than convulsions. In fact, it is a misnomer to include the latter condition, in some instances, in the category of convulsions, but in so much as convulsions so frequently accompany the delirium I shall, for practical and therapeutic purposes, include delirium.

THERAPEUTICS

In the instance of convulsions due to infections, such as those that complicate distemper, typhus, cerebro-spinal meningitis,

¹Read before the fortieth annual meeting of the Illinois State Veterinary Medical Association and fourth annual University Veterinary Conference, Champaign-Urbana, Ill., July 10-11-12, 1923.

etc., and dietetic deficiency conditions, quick removal of the cause is out of the question. Control being our only hope, such drugs as the bromides, chloral hydrate, gelsemium, *Passiflora incarnata*, lobelin sulphate, etc., have not only failed us miserably, in the control of convulsions due to infections and deficiency conditions, but are, on account of their depressant action, detrimental to the possible recovery of the patient.

Such convulsions, as well as epileptic convulsions, can best be controlled by luminal or by luminal-sodium, of which I will treat more fully later on in this article. On account of convenience I prefer luminal-sodium.

For the other type, in which the cause is more or less quickly removable, are these cases due to worms, overloaded stomach, indigestible material in the stomach or intestines, obstipation, obstruction of the bowels, etc., and those due to fright or excitement which may be included in this category, as fright or excitement will rarely, if ever, cause convulsions unless accompanied by an overloaded or at least a full stomach, or possibly obstipation.

In this latter class the sheet-anchor drugs are apomorphin hydrochlorid, arecolin hydrobromid and luminal-sodium, augmented in convulsions due to infections and dietetic deficiencies by barbital (veronal) and horse nettle berries.

STANDARDIZED TREATMENT

In fact, these five drugs, properly handled, constitute my "standardized treatment" for convulsions. Surely not a formidable list of drugs. However, they constitute a most formidable battery against convulsions.

In some cases apomorphin and luminal-sodium constitute the battery of defense, in some it is arecolin and luminal-sodium, while in others, the infections and dietetic deficiency cases, it may be luminal-sodium or the fluid extract of horse nettle berries or possibly barbital, if necessary.

In those cases of convulsions which are preceded by a frightened appearance, loud yelping and barking and a tendency to run, there is some material in the stomach, perhaps a piece of cloth, waste or some such material, wedged in the pyloric orifice, which must be removed to cut short the attack and to prevent a continuance of the convulsions to a fatal issue.

For the removal of such obstructive and perhaps toxic material apomorphin hydrochlorid is used in doses of one-tenth to one-

fifth of a grain, dissolved in a little water and administered hypodermatically. For pups under two months old one-thirtieth to one-twentieth of a grain is usually sufficient. In some rare cases there seems to be paralysis of the stomach, especially if the condition has prevailed for ten to twelve hours; then the apomorphin may have to be repeated, at fifteen-minute intervals, for two to four doses. Should this repetition of doses fail, then the stomach should be washed out, for even though the apomorphin may fail to produce emesis (in one case in a thousand) it causes such sedation that gastric lavage can be performed.

The veterinarian usually gets these cases promptly, on account of the fear that they inculcate in the minds of the laity that the dog has "gone mad." In many such cases, after the stomach has been emptied, the convulsions cease without additional treatment, though there are sufficient exceptions to justify the veterinarian in always following up the emetic after its action has ceased (one-half to one hour), with the proper doses of luminal-sodium, to check any further convulsions and to quiet the patient, which should be put in a dark, quiet place to rest and sleep.

CONVULSIONS CAUSED BY PARASITES

In convulsions due to worms, obstipation or toxic material in the intestines, all of which may cause convulsions varying from the mildest to the most violent type, but minus the delirium of the stomach causes, arecolin hydrobromid followed later by a dose of luminal-sodium is the battery of defense chosen.

The foregoing types of convulsions rarely require more than one to three doses of luminal, and frequently the convulsions subside upon relieving the stomach or bowels of their offending material, especially when apomorphin is used, as it has anti-spasmodic and sedative actions in addition to its emetic action.

In those cases due to *not readily removable causes*, such as infections and dietetic deficiency conditions, the battery of defense is luminal, to control the violent convulsions, and fluidextract of horse nettle berries, to subdue the convulsions concomitant with spinal meningitis. Either drug, administered two or three times daily, usually controls the convulsions, although they may be given more frequently if necessary.

Barbital (veronal) is not often required when luminal is used. It may be used in very severe cases, should the luminal fail to cause sleep, or it may be used in the absence of luminal, although

luminal is the preferred drug in the treatment of convulsions on account of its greater curative properties. Barbitol is more hypnotic than luminal, while luminal is more anticonvulsant than barbitol.

PHARMACOLOGY OF THE DRUGS USED

Apomorphin hydrochlorid is the salt of an artificial alkaloid of opium, very soluble in water. It is obtainable in 1/20- to 1/10-grain tablets. The dose, hypodermatically for dogs, is 1/20 to 1/5 grain. In strychnin convulsions large doses are required and may have to be repeated.

Principal physiological actions: In full doses it is emetic, antispasmodic and sedative. In small doses (1/40 grain) it is a liquefying expectorant and sedative to the respiratory mucous membranes. As an emetic it acts in from three to ten minutes. In cats it acts as a very-quick-acting emeto-cathartic.

ARECOLIN HYDROBROMID

Arecolin is the active principle of areca nut and although it does not seem to have the vermicidal effect of the powdered nut, it is remarkably effective as a quick-acting vermifuge and cathartic, acting especially well for the removal of tapeworms. It is very soluble in water. The dose for dogs by the mouth is — to $\frac{1}{4}$ grain for puppies under two months of age; for older dogs $\frac{1}{4}$ to one grain and even $1\frac{1}{2}$ grains, according to age and size or weight. It acts in from ten to sixty minutes, usually in less than thirty minutes, if a proper dose has been given. It is remarkably safe for the dog.

LUMINAL AND LUMINAL-SODIUM

Actions—Luminal is one of the most powerful of the modern synthetic hypnotics. In large doses, up to seven to ten grains, it produces deep sleep in severe mental disorders, except in the presence of marked excitement or pain. It must be employed cautiously, in small doses. It has also proved to be a powerful sedative, especially in epileptic conditions. In properly selected doses it does not depress the heart or respiration, and acts satisfactorily in small doses in various convulsive conditions.

It does not irritate the kidneys, when used in the customary range of doses. It exerts a pronounced and antispasmodic action in epileptic and other convulsive conditions. In the form of luminal-sodium it may be given rectally and subcutaneously, as well as orally. For this reason I use the sodium salt in preference to luminal which can be given only orally.

Description—Luminal is a white, odorless and somewhat bitter powder, almost insoluble in cold water, but dissolving readily in organic solvents and dilute alkalies.

Luminal-sodium is a white, crystalline, hygroscopic powder, very easily soluble in water. Solutions, however, decompose and should not be kept over one week. Luminal and its sodium salt are obtainable in powder and in tablets, luminal in 1½- and 5-grain tablets and luminal-sodium in 1½-grain tablets.

Dosage—Ordinary range of dosage is from one and one-half grains to ten grains. Of the luminal-sodium I usually give from one and one-half to three grains, to a dog of average size, grading the dose according to the severity of the convulsions.

In epilepsy or prolonged convulsions I give one and one-half grain two or three times daily. The salt is somewhat slower in action than luminal itself. In dogs effects are obtained in from thirty to sixty minutes, when given orally, somewhat more quickly when administered subcutaneously. The same doses may be used subcutaneously or rectally, as when given orally.

BARBITAL

This drug was formerly known as veronal, when it was patented and made in Germany, but since being made in the United States it is known as barbital. It occurs as a white powder and in 5-grain tablets.

Dosage—Five to fifteen grains; ten grains, however, seldom has to be exceeded in the dog to produce sleep.

Actions—It is somewhat anodyne, antispasmodic and markedly hypnotic, causing deep, restful sleep. In large doses it is a cardiac and respiratory depressant.

HORSE NETTLE BERRIES

Solanum carolinense—Lin.

This drug is a spinal sedative and I find it most useful to control and maintain in control the convulsions of spinal meningitis.

Dosage—Dog: One-half to one dram of the fluidextract, two to three times daily, combined with some flavoring agent.

In conclusion I wish to mention that inasmuch as this paper has to do only with *convulsions* in dogs, I am precluded from taking up the treatment of the basic cause of convulsions of the not readily removable type, as that would necessitate my considering the treatment of a number of diseases mentioned in the fore part of this article, which would be far too lengthy for the purpose of this paper.

POTENCY TESTS FOR BLACKLEG FILTRATE AND AGGRESSIN BASED ON THE AGGRESSIVE ACTION OF THESE PRODUCTS*

By JOSEPH P. SCOTT, *Manhattan, Kan.*

Potency tests for blackleg products based on the immunization of laboratory animals have not proven satisfactory. Consequently, tests that measure potency in degrees of aggressiveness or, "aggressive units," have been devised at the Veterinary Laboratories of the Kansas Agricultural Experiment Station. The first of these tests, the neutralization test, was worked out in 1918 by Goss and Scott¹. The other, the "washed culture" test, was developed during the past winter and is here presented.

In performing immunity tests on laboratory animals, two assumptions must be proven. First, that the animals under consideration, in this case guinea pigs, are susceptible to the disease and show some degree of uniformity in this susceptibility; and second, that a measurable amount of immunity can be produced in these animals.

It is well known that guinea pigs are susceptible to blackleg. However, the variability of the susceptibility is great. This variation is perhaps most easily seen in examining the records of potency and safety tests for powder blackleg vaccine. The potency test is performed by giving four guinea pigs doses of 40, 25, 15 and 7.5 mg. of powder vaccine. The safety test is run on nine guinea pigs, three getting 3 mg., three 5 mg., and three 7.5 mg. of powder vaccine. These tests often shown that a vaccine tested by means of the potency test has a minimum killing strength (m.l.d.) of 40 mg. and when tested for safety, a minimum killing strength of 3 or 5 mg., showing a variation in strength of eight to ten times the smallest killing dose. The same results within slightly reduced limits have been found when using pure cultures of *Clostridium chauvei*, or in using powdered muscle virus. The size of the guinea pig has been found to have little effect on the degree of variation of susceptibility.

GUINEA PIG IMMUNITY TEST

The degree of immunity that it is possible to produce is very low. (See Table I).

*Contribution from the Veterinary Division, Agricultural Experiment Station, Kansas State Agricultural College.

TABLE I—IMMUNIZATION OF GUINEA PIGS BY MEANS OF BLACKLEG PRODUCTS

Guinea Pig		Immunization			Test Injection			Results																			
No.	Weight	Product	Dose	Date	Product	Dose	Date	Kind	Amt.	MLD	Date	1st	2nd	3rd	4th												
504	300	anti-blackleg serum 46	.1	3/22	culture virus	7 mld	3/23	powder virus 1641	2 mg	1	4/2	OK	2X	D	OK OK D												
505	250		7			2	1X		1X	OK	2X																
506	200		7			2	1X		1X	OK	1X	D															
507	200		7			2	1X		1X	OK	1X	D															
508	250		7			2	1X		3X	D	D																
509	200	.1			7				2	1		D															
516	175	powder vaccine 1970	40 mg.	3/27		Preliminary Observations			powder virus 1641	5 mg	1½	4/9	1X	1X	2X	D											
517	200		1X			1X	1X	OK									OK										
518	300		1X			1X	1X	1X									1X										
519	300		1X			2X	3X	3X									3X										
520	400		1X			2X	2X	2X									2X										
521	200	15			1X	2X	2X		5	1½		3X	OK	OK	OK												
439	300	powder virus 1970	6 mg.	3/17	OK	OK	OK	powder virus 1641	2 mg	1	4/1	1X	OK	OK													
440	300		4													OK	OK	OK									
441	300		10													OK	OK	OK									
442	300	1641	2	3/29	OK	OK	OK		2	1	4/12	1X	OK	OK													
533	275		2													OK	D										
534	300		2													OK	OK										
263	300	aggressin 208	2 cc	1/19				culture virus	.3	1	1/31	1X	3X	3X													
264	400		3													2X	1X	1X									
265	400		4													2X	3X	3X									
266	400		5													3X	1X	D									
268	400		3													1X	1X	1X									
269	400	4	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X												
270	300	5	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X												
299	275	Filtrate 1052	2						.3	1		OK	OK	D	OK												
300	400		3													1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X
301	350		4													1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X
302	400		5													1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X
303	400		2													1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X
304	400		3													1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X
305	300		4													1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X
306	350	5	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X	1X													

X indicates the amount of swelling: 1X, small; 2X, moderate; 3X, large; D, dead.

In Table I a comparison of three methods of producing immunity in guinea pigs is made. First, by the use of anti-blackleg serum and virus; second, by the use of powder vaccine or virus; and third, by the use of filtrate and aggressin. The only case where a measurable amount of immunity was produced was one in which powder vaccine was used. The vaccination reaction shows that the guinea pigs that lived after the test injection of virus, had developed marked lesions on vaccination. This degree of reaction would have produced death in more susceptible guinea pigs, which shows that these guinea pigs had a natural resistance to blackleg. The fact that it is very difficult to produce an immunity in guinea pigs by the injection of blackleg products, and the undoubted fact (Table IV) that it is possible to give calves a very high degree of active immunity by the use of blackleg filtrate or aggressin, led to the development of a test which, by the use of large doses of virulent mixtures of virus and filtrate, would eliminate, to a considerable degree, the variation in susceptibility of guinea pigs.

NEUTRALIZATION TEST

The "neutralization" test is based on two facts; first, that the products of growth of the causative agent of blackleg, *Clostridium chauvei*, whether produced in the animal body (aggressin) or in culture media (filtrate), are absolutely non-toxic; second, that small amounts of aggressin or filtrate will activate sublethal doses of blackleg virus.

TABLE II—TEST SHOWING THE NON-TOXIC NATURE OF AGGRESSIN AND FILTRATE²

Guinea Pig		Product		Results			
Number	Weight	Aggressin		1st	2nd	3rd	4th
		Dose	Date				
857	500	5 cc	10-20-19	O.K.	O.K.	O.K.	O.K.
858	400	7	10-20-19	O.K.	O.K.	O.K.	O.K.
307	400	15	1-14-20	O.K.	O.K.	O.K.	O.K.
308	450	23	1-14-20	2X	1X	O.K.	O.K.
Filtrate							
285	300	5 cc	1-13-20	O.K.	O.K.	O.K.	O.K.
286	400	7	1-13-20	O.K.	O.K.	O.K.	O.K.
305	500	15	1-14-20	O.K.	O.K.	O.K.	O.K.
306	500	25	1-14-20	O.K.	O.K.	O.K.	O.K.

Table II shows that blackleg aggressin and filtrate are non-toxic. Large doses of these products produce no lesions in guinea pigs, other than a swelling due to the large amount of foreign material to be absorbed.

The second basic fact for the neutralization test, that sublethal doses of blackleg virus are activated by a certain amount of filtrate or aggressin, is shown by immunizing a guinea pig with

anti-blackleg serum, and if, a few hours later, it be given a small dose of virus, together with blackleg aggressin or filtrate, it will die, showing typical lesions of blackleg. Guinea pigs receiving the same dose of serum, followed by the dose of virus, this time without the addition of aggressin or filtrate, show no reaction. This shows that the active substance in these products is a true aggressin.

By means of the neutralization test (Table III) it is possible to determine the aggressive strength, in terms of aggressive units, of the aggressin or filtrate tested. An aggressive unit is that amount of aggressive substance that will neutralize one anti-blackleg unit of anti-blackleg serum. Before the neutralization test can be used it is necessary to determine the m.l.d. of the virus and the potency of the immune serum to be used.

The m.l.d. of the virus is determined by giving six or more guinea pigs graduated doses of virus, 0.1 to 0.5 cc. The dose selected as the m.l.d. is determined from the guinea pig dying within 48 hours, which received the smallest dose. The m.l.d. should kill all guinea pigs tested, and all guinea pigs receiving higher doses should also be killed.

The potency of the anti-serum is determined on three to six guinea pigs. These are given 0.1 to 0.01 cc of serum depending on its presumed strength, and 15 hours later graduated doses of virus. (1 to 4 m.l.d.). The guinea pig receiving the largest dose of virus, that does not die, determines the potency of the serum.

TABLE III—THE NEUTRALIZATION TEST

Guinea Pig		Immune serum No. 46 Dose—.15 cc Date—2/1/23	Product		Culture virus No. 28A			Results		
Number	Weight		Kind	Dose*	Dose	MLD	Date	1st	2nd	3rd
663	350		Filtrate 1296	5 cc	.5 cc	2	2/2/23	1X	OK	OK
664	400			4	.5	2		2X	1X	OK
665	350			3	.5	2		2X	1X	OK
666	250			2	.5	2		OK	OK	OK
667	200		Filtrate 197	5	.5	2		1X	1X	OK
668	300			4	.5	2		2X	D	
669	400			3	.5	2		1X	1X	OK
670	250			2	.5	2		1X	OK	OK
671	300	Aggressin 210	5	.5	2		3X	3X	D	
672	200		4	.5	2		1X	1X	1X	
673	250		3	.5	2		3X	D		
674	300		2	.5	2		3X	3X	D	
683	250			1.5	5		OK	OK	OK	
684	200			4.2	16		½X	OK	OK	

*2/2/23

Table III shows the results of the neutralization test. On the evening of February 1, 1923, twelve test guinea pigs and two check guinea pigs were injected with .15 cc of anti-blackleg serum No. 46. This serum had been previously titrated and

found to have a protective strength of 100 units per cc. Therefore, .15 cc of serum contained 15 anti-blackleg units. The check guinea pig (No. 684) showed protection against 16 m.l.d. of the virus used.

Fifteen hours later, February 2, 1923, varying doses of filtrate and aggrassin mixed with two m.l.d. of culture virus were injected and the guinea pigs observed daily for the three following days, at which time the test was read. In analyzing the test we noticed that of the four guinea pigs injected with filtrate 1296, two guinea pigs (664 and 665) receiving 3.0 and 4.0 cc of filtrate showed marked lesions. Guinea pig 665, receiving the smallest dose of filtrate (3.0 cc) determined the strength of the serial. Guinea pig 665 was immunized against 15 m.l.d. of virus. It received 2 m.l.d. of virus and 3 cc of filtrate 1296. Therefore, it is evident that the 3 cc of filtrate neutralized the action of 13 anti-blackleg units of serum, allowing marked lesions to develop. So, 3 cc of filtrate 1296 has a strength of 13 aggressive units and one 5-cc dose of filtrate 1296 has an aggressive strength of 21.65 aggressive units. One dose of filtrate 197, in the same way, has a strength of 16.25 units and aggrassin 210 a strength of 32.5 units.

A comparison of the guinea-pig-immunity test, the neutralization test and the production of immunity in calves was made with the following results.

Table IV shows the immunization of Hereford calves, eight to twelve months of age.

TABLE IV—IMMUNIZATION OF CALVES BY MEANS OF BLACKLEG FILTRATE

Filtrate				Virus			Results		
Calf	No.	Dose	Date	No.	Dose	Date	1st	2nd	3rd
1	1	5 cc	10/23/17	1	10 cc	11/17/17	OK	OK	OK
2		5			10		OK	OK	OK
3		5			10		Lame	Lame	OK
4		5			5		Lame	OK	OK
5		5			5		Lame	OK	OK
6	2	5	11/15/17	Frey	5	1/3/18	Lame	OK	OK
1020		5			5		Lame	OK	OK
1021		5			10		Lame	Lame	Dead
1022		10			10		Lame	Lame	Dead
		10			10		Lame	Lame	Dead

Table IV shows that filtrates 1 and 2 had a very high degree of immunizing power. Both of these filtrates, when tested on guinea pigs by the guinea-pig-immunity test, gave the following results: Eight guinea pigs were used on each serial, two guinea pigs receiving 2 cc; two, 3 cc; two 4 cc; and two 5 cc; and ten days later 1 m.l.d. of virus. Of the eight guinea pigs given filtrate 1, four died; of the eight guinea pigs given filtrate 2, five

died, showing that there was no correlation between the calf and the guinea pig immunization powers of filtrate.

Filtrate 1 was tested by the neutralization test and a strength of 13.5 aggressive units found.*

WASHED CULTURE OR WASHED VIRUS TEST

The second aggressive action test is known as the "washed culture" test. This test depends on the fact that virulent cultures of *Clostridium chauvei* are rendered avirulent by repeated washing in salt solution. Leclainche and Valleé³ showed that heated spore cultures of *Cl. chauvei* were avirulent and non-antigenic, in that these heated spores did not produce an immunity in cattle.

The avirulence of virulent blackleg cultures, washed by centrifugalizing three times in salt solution and making up to original volume, is shown in Table V.

TABLE V—AVIRULENCE OF WASHED VIRUS

Guinea Pig		Product			Results				
No.	Weight	No.	Dose	Date	1st	2nd	3rd	4th	5th
441	600	28A	15 cc	12/9/22	1X	2X	2X	OK	OK
442	600		7		OK	OK	OK	OK	OK
223	325	3	3	12/30/19	OK	OK	OK	OK	OK
224	425	3	.5		OK	OK	OK	OK	OK
255	300		5	1/5/20	OK	OK	OK	OK	OK
256	300		5		OK	OK	OK	OK	OK
257	300		2.5		OK	OK	OK	OK	OK
330	500		10		OK	OK	OK	OK	OK
830	700	2	15	3/16/23	1X	1X	OK	OK	OK

If small doses of washed virus and small doses of filtrate be mixed and injected into a guinea pig, typical blackleg is produced. This shows that blackleg aggressin and filtrate contain a

TABLE VI—DETERMINATION OF POTENTIAL M.L.D.

Guinea Pig		Virus			Filtrate							
No.	Wt.	No.	Dose	Date	No.	Dose	Date	1st	2nd	3rd	4th	
370	600	28A	.3 cc	12/9/22				2X	1X	1X		
371	250		.3					3X	D			
372	600		.3					1X	1X	1X		
373	250		.2					3X	3X	3X		
816	250	28B	.3	3/12/23				OK	OK	OK		
817	500		.4					OK	OK	OK		
818	300		.6					½X	3X	3X		
Washed Virus												
489	350	28A	.5	12/20/22	1195	.3 cc	12, 20, 22	2X	3X	D		
490	350		.5			.4		OK	3X	D		
491	350		.5			.6		D				
754	600	28B	.6	3/14/23	298	.7	3, 14, 23	OK	OK	3X	3X	
755	250		.8			.7		3X	D			
756	200		1.0					3X	D			

true aggressin. The washed culture test depends on measuring the smallest dose of filtrate that will activate a unit of washed

*loc. cit.

culture corresponding to one m.l.d. of virus. This unit, the potential m.l.d., is calculated by comparing the m.l.d. of the virus, prior to washing, with the smallest dose of washed culture that becomes activated by small doses of filtrate.

The determination of the potential m.l.d. of washed virus is shown in Table VI, which shows that the m.l.d. of virus 28A was 0.3 cc, the potential m.l.d. of washed virus 28A 0.5 cc, the m.l.d. of virus 28B 0.6 cc — and the corresponding potential m.l.d. of the washed virus 28B 0.8 cc.

TABLE VII—WASHED CULTURE TEST

Guinea Pig		Washed Virus		Product	Dose	Date	Results		
No.	Weight	No.	Dose				1st	2nd	3rd
614	350	28A	.4 cc	Filtrate	.2 cc	1/18/23	3X	OK	OK
615	350		.4	1296	.4		2X	3X	3X
616	350		.4		.6		2X	3X	3X
617	300		.4	Filtrate	.2		3X	3X	3X
618	300		.4	197	.4		3X	D	
619	300		.4		.6		D		
620	350		.4	Aggressin	.2		3X	3X	OK
621	350		.4	210	.4		3X	D	
622	350		.4		.6		D		
819	300	28B	.7	Filtrate	.2	3/16/23	OK	1X	OK
820	250		.7	197	.3		OK	OK	OK
821	300		.7		.4		1X	3X	D
822	250		.7	Filtrate	.2		OK	OK	OK
823	300		.7	298	.3		OK	3X	D
824	300		.7		.4		OK	1X	D
825	250		.7	Aggressin	.2		2X	D	D
826	300		.7	210	.3		1X	3X	
827	225		.7		.4		1X	D	

In the tests shown in Table VII the potential m.l.d. of washed virus 28A was taken to be 0.4 cc and that of 28B as 0.7 cc. Virus 28A was obtained from brain-liver culture of strain 28, 28B from a second lot of brain-liver culture, strain 28. It is seen that the virulence of these two batches of virus varies greatly. The virulent substance is apparently in the washed-virus part of the virus, not in the soluble products removed. This would indicate that the degree of virulence of the organisms does not affect the amount of aggressive substance produced. At present this problem is being considered from the standpoint of measuring the aggressive action of filtrate from virulent and avirulent strains. The results obtained indicate that filtrates from avirulent strains have as high an aggressive titre as those obtained from virulent strains.

A washed-culture test on three serials of filtrate and one serial of aggressin is shown in Table VII, where it is seen that 0.4 cc of filtrate 1296 activated one potential m.l.d. of washed virus

28A. From this it is seen that one 5cc-dose of filtrate 1296 and aggressin 210 has a strength of 25 units, as the pigs receiving 0.2 cc showed marked swellings of a grade indicating that death was almost reached. These results are compared with those obtained for the same serials obtained by the neutralization test in Table IV.

	Serial	Washed-Culture Test		Neutralization Test
		28A	28B	
Filtrate	1296	12.5		21.65
Filtrate	197	25	12.5	16.5
Aggressin	210	25	25	32.5

Cattle also show this aggressive reaction quite clearly. Several cases of vaccination with spore vaccine, followed in a few weeks by blackleg filtrate, have resulted in death from blackleg within three days after the administration of blackleg filtrate.⁴

CONCLUSIONS

1. Guinea pigs show a very marked variation in their susceptibility to blackleg inoculations.
2. Guinea pigs are not readily immunized against blackleg inoculations.
3. It is possible to measure quantitatively the amount of aggressive substance found in blackleg aggressin and filtrate by means of the neutralization and washed-culture tests.
4. A filtrate that showed high powers of immunization in cattle was found to have an aggressive strength of 13.5 units.
5. Considerable correlation in the results between the two aggressive-action tests was found.

REFERENCES

- ¹Goss, L. W. and Scott, Jos. P. 1918. Standardization of Blackleg Vaccine. Jour. A. V. M. A., VII, 3, p. 234.
- ²Scott, Jos. P. Blackleg Vaccines: Their Production and Use. Kansas Agricultural Experiment Station Technical Bulletin 10.
- ³Leclainche et Vallée. Reported by Kitt, in Kolle und Wasserman, Handbuch der Pathogenen Mikro-organismen, 1912, IV. p. 824.
- ⁴Scott, Jos. P. 1923. Notes on Blackleg Immunization. North Amer. Veter. IV, 4, pp. 267-270.

MAJOR SURGERY

Willis: "Where have you been?"

Gillis: "In the hospital, getting censored."

Willis: "Censored?"

Gillis: "Yes, I had several important parts cut out."—*Judge*

THE TREATMENT OF RETAINED PLACENTA OF COWS¹

By JOHN P. TURNER, *Washington, D. C.*

This subject has been selected on account of its importance to cattle husbandry and also for the reason that all of us know something concerning its proper treatment and yet all of us have much more to learn. Ten years ago, it was easy to talk about this disease and apparently we were well satisfied with our knowledge of the subject and its practical application.

But, thanks to the researches of Prof. W. L. Williams, of this country, Prof. Hesse, of Switzerland, and Dr. Albrechtsen, of Denmark, we have had much light on this subject and our hopes are that since the practice of bovine gynecology has made such rapid strides for betterment in recent years, we may yet know much more than we do at present.

Personally, I feel that each year gives us more information, and that within a few years we may have a better understanding of this disease and, what is far more important, that the breeder and dairy farmer will sooner or later arise to a sense of realization of the seriousness of this disease, of which retention of the placenta is the only visible symptom.

Almost daily, we get the usual call to "clean a cow" and the average farmer and breeder thinks it is just a mere mechanical job, which is either too filthy for him to undertake or he feels a little uncertain as to just how far he should go in self-treatment, or how much traction should be exerted. Frequently a neighbor, with great self-assurance would do the work for him or some herdsman, who thought he knew all about it, would boldly "walk where angels fear to tread."

For many years one of the largest breeders in this state has permitted his herdsman to remove all placentae, the owner boasting of the latter's skill. Suffice it to say, there is a great deal of sterility in this herd and there always will be, if the present practice continues.

This disease is seldom considered at a meeting of veterinarians, that both the moral and practical issue are not argued. The owner, who is usually very much unenlightened as to the gravity of this condition, wants the semi-putrid, offensive placenta removed, thinking that with its removal the disease is cured.

¹Presented at the seventh annual meeting of the Maryland Veterinary Medical Association, Frederick, Md., July 19-20, 1923.

The veterinarian is not blameless in this situation. He may not be as enlightened on the subject as he should be. He may be in a rut and ceases to use his cerebrum, depending too much on his strong right arm. He may also have a competitor in practice, who is one of those voluble, self-assuring fellows, who does not bother much with the code of ethics.

Now, what is the too frequent procedure. He examines the patient and finds the placenta quite adherent. Meanwhile the idea rolls in his mind that this client is good for only one call with this particular disease and that if he does not go through the mechanical work of removing the placenta, the farmer will be dissatisfied and will send for his competitor, who always removes them. This is not a pipe-dream, but an everyday occurrence. In my opinion, it requires a very conscientious veterinarian to do this work properly. Seldom do I leave a case, where the placenta is manually removed, that I am absolutely contented and self-satisfied with my work, and this feeling is growing on us with each succeeding year.

Let us consider the high-points of this disease. A cow calving normally usually passes the placenta within twelve to twenty-four hours. If its retention persists beyond this period, there is infection present in that uterus, which has developed either before or during pregnancy, mostly before, and does not manifest its symptoms until the calf has been expelled, either normally or abnormally, as in abortion. When a normal cow delivers her calf, the umbilical cord parts, the chorion begins to die and it should be sequestered by the endometrium, pass out of the cervix and be expelled.

Placental adhesion always precedes parturition and is not caused by the latter act. The infection causing this disease may be a streptococcus, or a colon type is frequently present as a secondary invader. The maternal crypts becomes inflamed and owing to the intimate relations of the chorionic tufts, the latter are completely involved. They become greatly enlarged and swollen and are incarcerated into the similarly enlarged and swollen placental crypts and we have retention of the placenta as a result.

The placentitis always begins at the cervical end of the uterus and proceeds towards the horns. If the cow aborts early, the placenta frequently passes with the fetus, on account of the lack of development of the chorionic tufts and placental crypts, and the adhesion does not occur, as the infection has progressed

too rapidly for the proper incarceration of these undeveloped tissues.

The nearer to full term the abortion occurs, the greater the tendency to retention of the placenta, due to the aforestated reasons. However, in some cases of late abortion, the placenta may pass with the fetus owing to the placentitis having advanced very rapidly and completed its course by the bursting open of the incarcerated tissues. If the development of the foetus has progressed faster than the infection in the uterus, we have a live calf and a decidedly adherent placenta, often more serious than had abortion occurred.

If the calf is strong and lusty, the usual course is that the placentitis is not severe and involves only a few cotyledons, near the cervical end of the uterus, while those near the ovarian end are probably healthy. This is the usual type of retained placenta which separates easily and leaves very little trace of endometritis, and in which the cow is again fertile. However, should the calf be weak at birth or develop dysentery in a few days, the probability is that the placentitis is severe and will endure for many days. The virulence of the infection has much to do with the character and length of the time of adherence.

In mild cases physiological functions may re-establish themselves and the separation occurs rapidly, before a firm incarceration has occurred. Again, the infection may be so severe as to cause necrosis of all or part of the cotyledons, with sloughing within two or three days after calving and thus ends the retention. Occasionally retained placentae are not visible and may be either attached or unattached to the cotyledons, depending on the course of the placentitis, or we may even have sloughing off of the cotyledons and the whole mass may be more or less incarcerated by a semi-paretic uterus. A constricted cervix may also be at fault, holding back this mass, which, if not surgically removed, is sure to undergo putrefaction and establish pyometra.

Very frequently we are called to treat cows that are ailing following parturition and are informed that she has passed the placenta. We always examine such a case, both by the rectum and vagina, just as much as a matter of routine as you would remove a shoe, in any case of lameness of the horse, before making a diagnosis. Very frequently the placenta in part or as a whole may be adherent, the owner being mistaken by what he has seen passed by the cow.

Retention of the placenta is a symptom of one of the most destructive diseases of cows, especially full-blood animals. I allude to metritis. Not only do we have quite a high mortality rate, as occurs at times, where a perfect storm of fatal metritis attacks a herd, but the economic loss, as well, from loss of physical condition and loss of production, where metritis appears with its predominant symptom—retained placenta. It also causes more incurable sterility than any other disease, on account of the destruction of the endometrium.

The oily-tongued charlatan, be he either graduate or non-graduate, who extols this or that cure for retained placenta, is a dangerous menace to animal husbandry. He should be visited by one of these metritis "storms," early in his career, on a horse- or cow-breeding farm, and when he finally awakens he will realize that his education along these lines is just beginning, if he still possesses any gray matter along his ears.

Opinions of the best veterinary gynecologists differ in many respects concerning the removal of placentae. Many of the best do not manually remove a placenta. One of the leading specialists in the treatment of sterility does not pay any attention to the removal of placentae, simply keeping them as clean as possible by external antiseptic application and vaginal irrigation with normal salt solution.

His argument is that all surgical interference with the interior of the uterus carries more or less infection with it and that few men have arms of sufficient length to enable them to remove placental adhesions, especially in the horns of the uterus and if he tears the chorionic tufts from the maternal crypts he opens a fresh wound which may become a new centre of bacterial infection.

Another eminent specialist treats these cases, depending on whether they are scrub cows or full-bloods. He manually removes the placenta of a scrub cow and pumps a large amount of weak disinfectant solution into the uterus, using normal salt solution as the last solution to be pumped in, and allows the latter to remain in the uterus. But, with high-grades and full-bloods, he has learned that this is a dangerous practice and that the placenta must not be removed until it comes away with very little "unbuttoning" and with very little traction exerted.

Undoubtedly there is much less resistance in the uterus of a highly bred animal, kept under modern, high-pressure dairy conditions. From a long experience, we know that the hardy,

scrub cow will withstand much mismanagement in such diseases as we are speaking of, and many of them will remain fertile. But do not try crude work with full-bloods. Many of us earn our living through the mismanagement of this disease and, personally, I do not relish their treatment, as such a very large percentage are incurably sterile from destroyed mucous membrane. A very prominent breeder of cows in this state will not allow his veterinarian to remove a retained placenta, owing to the large number of sterile cows resulting from his treatment. He states that he occasionally loses a cow from metritis, but those that recover are usually breeders. This is an illustration of the financial loss to the veterinarian, who either has not properly educated this breeder or, on the contrary, he may mismanage his cases.

I believe there is a middle ground to stand upon, not going to extremes either way. I have frequently seen cows ruined and destroyed by the too early removal of the placenta and, on the contrary, the same condition has been observed, where chronic, incurable pyometra has developed where no attention whatever has been paid to treatment.

Certainly the removal of a placenta is to be desired, if it can be removed without injury to the uterus. This is desirable if we are to treat the endometritis which has caused the adherence. The removal of a placenta is imperative if the cotyledons have all sloughed off and it is lying as a putrefying mass in a paretic uterus, but very much care and judgment is necessary, even in this latter type of case, if the cervix is contracted. Careful dilation of the cervix and gentle traction on the mass will often give happy results.

Put on your rubber operating frock and hood, using a sleeveless sweater underneath in winter and a large oversweater to cover the body and arms until ready to enter the cow. Provide your own basins (enamel), white soap and towels. Wash the tail, vulva, udder and buttocks, after you have emptied the rectum, and pass the tail to the side, securing it to a ring and cord passed around the girth. After you have washed the cow and thoroughly soaped your arms and hands, pass the gum tubing into the vagina and irrigate with a gallon of normal salt solution. If the placenta is foul, a weak solution of therapogen is used for irrigation.

Potassium permanganate was discarded several years ago, owing to the caustic effect on the vaginal mucous membrane of

any undissolved crystals. It is doubtful if washing the uterus before removal of the placenta is of any value, unless part of the chorion has broken and passed out, otherwise we would simply be washing the bag from which the calf had been removed and our liquid would not come into contact with the uterine mucous membrane. We wash the vagina to remove mechanically threads and semi-necrotic parts of the chorion.

Then begin your examination, starting at the cervical end of the uterus. If but a few loosely attached chorionic tufts are attached to the cotyledons, then we loosen them with gentle traction and a squeezing of the cotyledon between the thumb and fore-finger. A few minutes work should suffice to remove any placenta which should be removed.

Whenever I hear of a practitioner requiring an hour to remove a placenta, I feel sure there has been mismanagement and there will surely be a bad case of endometritis as a sequela. Most of the easily removed placentae would come away of their own accord. If the placenta is in proper condition to remove, and the uterus is contracting strongly, we wash the uterus with normal salt solution, using a funnel and gum hose and syphon out all of it. If the uterus is paretic, the less liquid placed in it the better.

Should the chorion be tightly attached to the maternal crypts, the owner is so advised and instructed as to what we are doing and why. In such a case we discontinue any further attempts at removal and introduce from one to two pints of mineral oil, to which has been added some bismuth-formic-iodide powder, into the horn of the uterus. This tends to allay inflammation, prevents putrefaction and generally has both healing and soothing qualities.

The dragging end of the placenta is cut off within three or four inches of the vagina, to prevent both calf and udder infection. Should little or no membrane be protruding, we fold four or five yards of gauze into a bag and introduce it into the uterus, allowing the end to protrude into the vagina close up to the vulva. This prevents closure of the cervix. If the cervix is contracted, we try to introduce some oiled gauze through it, with a sound, and renew it from time to time.

In your examination of a retained placenta beware of meddling too much with a uterus which is flaccid and fails to contract. The problem before you is not the mere removal of the foetal membrane at a given time, but is whether or not the removal is

going to do more injury to the uterus than the danger caused by its retention.

Drugs given internally have no practical value. Epsom salts is given as a purgative and eliminative, and the resultant straining may be of some value, but expulsion in these cases would come naturally, if given more time.

As to injecting normal salt solution into the chorionic vessels, I have tried it and find it of little value, as the placental capillaries are always blocked by thrombi and would not permit the passage of the solution, and furthermore, if it could be done, it would only make the capillaries swell and further increase their tightening the maternal crypts.

To keep the owner interested and busy, have him keep the external parts very clean and, with a funnel and gum tube, direct him how to give a daily vaginal wash of one gallon of normal salt solution. This keeps the membranes clean and fairly odorless, causes some straining and will not permit much of the solution to enter the uterus.

The hand and arm of the herdsman is not to enter the vagina or uterus under any conditions. Too much leeway has been allowed and too much credence given assumed knowledge of this subject, the seriousness of which is not surpassed by any other condition we are called upon to treat. Personally, I can see no more reason for allowing a herdsman to enter his arm into a bovine subject than a human subject.

We do not make haste in examining patients with retained placenta unless some symptoms of distress are noted, usually allowing the owner to give vaginal washings for two or three days. We frequently make two or three visits to a case before the placenta can be removed. This, of course, is where the animals have marked value or where the owner has confidence in our advice. With scrub cows the washings are maintained for three or four days and a second visit made. The seriousness of the case from the standpoint of sterility is always laid before the owner and we must, from a business standpoint, be somewhat advised by his stand.

Expediency may be resorted to, somewhat, in treating scrub cows with no great value, either as producers or breeders, but no such policy should be pursued with full-blood animals.

The placenta removed, we are then ready to treat the endometritis which has caused it. This we do by thoroughly dressing the cow, tying the tail sidewise, drawing the cervix to vulva and

introducing a 1 to 2% solution of Lugol's solution into the uterus with a uterine catheter, the amount depending on the state of the uterus which is determined by a prior rectal examination. If this shows a strongly contracting uterus one pint will be sufficient; if not contracting, but not parietic, we introduce two pints, depending all the time on whether the uterus contracts to our washing. If the Lugol's solution is forced out of the catheter in a fairly strong manner, say an inch, we have introduced enough. If no contraction exists, the treatment is stopped and syphoning undertaken, accompanied by gentle rectal massage. If the cervix shows much inflammation, such symptoms being shown as a marked swelling, somewhat purplish in color, pure Lugol's solution is used to swab the os and cervix, protecting the floor of the vagina with cotton.¹

This treatment is given every week or ten days and usually two to three treatments suffice. When there is no discharge from the uterus or cervix, as evidenced by failure to mat the hair of the tail, and the cervix looks contracted and pink, we have the case well underway. Should pyometra develop, as evidenced by a pus-like discharge, aggravated by lying down and evidenced by rectal pressure on the uterus, we always catheterize the uterus with a horse catheter and endeavor to empty it before introducing any solution, as the introduction of more fluid to an already overburdened uterus may cause rupture and death.

If the treatment of endometritis is undertaken in these cases, instead of the mere symptom of retained placenta, the owner will usually be repaid by having a fertile cow, and the veterinarian by not only an increased fee, due to the extra visits, but also by an increased appreciation of his services by the breeders, who will usually pass the good work along.

This more or less Utopian plan of treatment in a section which has not yet been properly blazed can be established only by the education of the veterinarian to a better practice of bovine gynecology and by a better education of the farmer to the seriousness of retained placenta, which can be done by plain talks, devoid of technical language, given to them, especially at farmers' and grange meetings.

If the idea has been brought out clearly that retained placenta is not a disease, but a symptom of a very serious disease, the proper treatment of which is of paramount importance to cattle breeding, then we will feel compensated, like the Boy Scout, that he has done a kindly deed today.

STERILITY IN CATTLE¹

By M. F. BARNES

*Pennsylvania Bureau of Animal Industry
Harrisburg, Pennsylvania*

A dairy cow, to function properly, besides producing a good quantity of milk, should give birth to a normal calf each twelve to fourteen months. The largest pure-bred herd in Pennsylvania, consisting of approximately 250 cows, produced an average of one calf per cow each year, for a period of ten years. This means that most every cow in the herd has produced a calf every year. The inability in some cows, to conceive in time to cope with the general average of the herd, has been made up for by a number of cows which have given birth to twins and a single calf within a year. One cow has a record of five calves in two years—two sets of twins and a single calf. This herd is well stabled, well cared for and well fed, but, it is not fed to produce high milk records. Sterile cows, or diseased cows, are not retained in the herd.

Production efficiency is not determined altogether on the basis of the amount of milk a cow is capable of producing within a given length of time. The principal aim of the dairyman is to have a large production of milk. The value of a dairy cow is determined by the amount of milk she can produce. The dairyman realizes that to keep milk production at the maximum, his cows must freshen about once a year. The pure-bred cattle breeder looks forward to getting as many offspring as possible and to having as much value in the offspring as it is possible to get. The value of the individual is not determined altogether by her appearance and type, nor quantity and quality of milk produced. To have high value, the individual's ancestors or progeny must be high producers. Thus, cows are very often heavily fed on narrow rations, large amounts of concentrates and little roughage, with the aim of producing high records. A rather high percentage of this class of cows became affected with conditions which cause sterility.

DEFINITION

Sterility is the absence of generative function and may affect either male or female animals. The absence of function may

¹Presented at the seventh semi-annual meeting of the Maryland Veterinary Medical Association, Frederick, Md., July 20, 1923.

occur as a result of the lack of development of some part or parts or all of the genital system; it may occur as a cessation of function once established; or it occasionally occurs in young animals with a normally developed genital system which has never functioned in the production of young.

CLASSIFICATION

Sterility may be classified as:

1. Absolute or permanent sterility. Reproduction impossible.
2. Temporary sterility. Reproduction occurs irregularly.

Animals do not reproduce for limited lengths of time.

The occurrence of abortion interferes with the production of normal young and from this standpoint is a temporary sterility.

IMPORTANCE

The question of sterility in cattle is of very grave importance to the agricultural industry. It interferes with the propagation of certain blood-lines of certain outstanding families in the various breeds. It concerns the pure-bred breeder in that it limits the number of valuable offspring and hinders the selection of the best individuals as breeding stock. It concerns the dairyman from the standpoint of the amount of milk produced. Its interference with the amount of milk produced is of grave concern to the pure-bred breeder also, more from the standpoint that it often interferes with high records, than from the standpoint of milk value.

CAUSES OF STERILITY

The causes of sterility may be divided into:

1. Predisposing, or indirect.
2. Actual, or direct.

Cattle abortion disease, caused by *Bacterium abortus* (Bang), is usually considered an indirect cause of sterility. It is probably indirectly responsible for more than fifty per cent of the cases of sterility in cattle, and possibly is directly responsible for a small percentage. The abortion organism is capable of causing inflammatory processes accompanied by the formation of pus pockets. A limited number of the cases of sterility in the bull are undoubtedly caused directly by *Bacterium abortus* (Bang). In the uterus of the female, *Bacterium abortus* (Bang) probably acts only as a predisposing cause of sterility, by paving the way for other organisms to become active after the fetus has been aborted or delivered at normal time. In abortion-infected herds which

have come under my observation, there has occurred a higher percentage of sterility than in herds free from infection with *Bacterium abortus* (Bang). There is a certain percentage of sterility in any large herd, but, if the percentages of abortion and sterility are represented graphically, the sterility graph usually follows the general order of the abortion graph.

In one large herd consisting of approximately 200 female animals, *Bacterium pyogenes* was the principal secondary invading organism. A large number of cases of sterility developed following abortions or apparently normal parturitions. Several cases were studied bacteriologically and invariably the *Bacterium pyogenes* was isolated. A few cows developed a generalized condition and died. Others developed generalized abscesses over the body, in the udder, etc., from which *Bacterium pyogenes* was isolated. Quite a number developed abscesses in the uterine wall, in the submucosa or under the serosa. Perimetritis, adhesions and permanent sterility were not uncommon. A number of the aborted fetuses were examined and, in each case, *Bacterium abortus* (Bang) was isolated in pure culture from the contents of the fourth stomach, which eliminates other organisms as a cause of the abortions.

Bacterium pyogenes and streptococci probably cause more serious damage than any other secondary infective organism of the female genital tract. In most all long-standing cases of septic metritis or septic infection of other parts of the genital tract of the cow, such cases do not respond to treatment, the *Bacterium pyogenes* or one of the group of streptococci can be isolated. Other organisms which have been found on a bacteriological study of septic endometritis are staphylococci which often are the cause of a moderately severe inflammation; also micrococci and rarely colon bacilli. A gas-producing organism which causes the formation of a rather large quantity of pus, having the appearance of curdled milk, is occasionally encountered in septic endometritis. The emanated gas has a very strong putrefactive odor.

The kind of feed which a cow receives is probably second only to abortion as an indirect cause of sterility. Cows fed on high protein diets for the purpose of causing heavy milk production, and those fed for fat production, in preparation for show circuit, are quite prone to become sterile and frequently become permanently sterile. Some relation between the ovary and the udder which we do not understand may be partly accountable

for the condition. The feed may not have so much to do with it. While a large amount of feed goes into the cow there is a heavy drain on those cows which are milked four or five times a day. It is possible that the question of the cause of this class of sterility may be solved by the addition of certain minerals to the diet; the addition of proper vitamins; or by the study of substitutes for diets now being used. These are questions for the agriculturist to solve. The solution may be in the field of endocrinology. An existing relationship between the ovary and udder in this class of cases is indicated by a change of the amount of milk produced, if the ovaries, which usually are cystic, are treated until cysts no longer form.

It is known to breeders that if these cases are treated, the amount of milk is considerably reduced. The excessive stimulation of the udder tissue by the large amount of concentrated feed fed the animal, or the stimulation of the udder tissue by frequent milkings, apparently has a very noticeable effect on the ovary. Repeated treatment of the cystic ovary in these highly fed cows very often has a marked effect on the udder which is indicated by a reduction in the amount of milk. It is known that the first manifestation of sexual maturity has a marked effect on the udder. Virgin heifers occasionally develop cystic ovaries and become true nymphomaniacs and often show a well developed udder. Nymphomaniac cows which have been dry can occasionally be put back into the milking line and produce enough milk to pay for their feed. One case which was dry became a nymphomaniac and after a time showed udder development, was placed in the milking line and is producing approximately thirty pounds of milk per day. There is a possibility in the highly-fed, record-producing cow that, instead of the trouble being in the feed, it is in the excessively stimulated udder, stimulated by feed or frequent milking, which has the effect of throwing the endocrine system out of balance. Through this process of unbalancing, there is some effect upon the ovaries which causes them to become cystic.

Other causes of sterility are the various forms of uterine inflammation—endometritis, myometritis and perimetritis. Inflammations in the vagina, cervix, fallopian tube or its fimbriated extremity; inflammation of the ovary or the retention of a corpus luteum, cystic condition of the ovary, fallopian tube or cervix.

Any condition causing inflammation of any part of the genital tract may act as a cause of sterility. Inflammation is the reac-

tion of living tissue against the action of an irritant. The irritant may be parts of a retained placenta, which is dead tissue, pus-producing organisms, pus, calcified material, mummified fetus, strong irritating substances introduced into the uterus; specific inflammations such as tuberculosis of the fallopian tubes, ovaries, uterus, etc.

Granular vaginitis is not usually considered to occupy an important position as a cause for sterility. In certain cases it does appear that granular vaginitis is the direct cause in heifers. Occasionally a number of heifers in a herd fail to conceive after repeated services. Heifers with a history of this kind, upon examination, usually are rather severely affected with granular vaginitis, no other abnormal conditions being found, and after repeated vaginal douches with a mild antiseptic, usually conceive.

Bacteria present in the uterus or cervical canal, by the formation of toxic products, may have a direct action on the spermatozoa, or may indirectly act as a cause of sterility by so altering the secretions that the spermatozoa are killed.

Other causes are stenosis of any portion of the genital canal which may be brought about by abnormal conditions in surrounding tissues or organs or by swelling of the mucosa in the narrower portions of this canal, as in the cervix, the smaller portions of the cornua or in the fallopian tubes; tumors within the genital canal or in the tissues surrounding it; misplacements and torsions; lacerations of the cervix; peritonitis causing adhesions of the ovaries, uterus, fallopian tubes or fimbriated extremity; close-breeding and in-breeding; endocrine system unbalanced.

Various other abnormal conditions which are less frequently observed may be the cause of sterility, such as, improper development or lack of development of the genital system or some portion of it. This is a cause of absolute or permanent sterility and is most likely to be observed in young animals which have failed to conceive.

Still other causes are old age, with atrophy of the ovaries or other portions of the genital tract; general constitutional diseases. Improper treatment in attempts to remedy a temporary sterility may be the cause of a permanent sterility. Puncture of the endometrium with a catheter is likely to cause abscess-formation in the uterine wall, peritonitis, adhesions, etc. The abnormal uterus is often lacking in tone, friable, and its walls easily punctured. In some cases of sterility, it is difficult or apparently impossible, to locate the cause clinically.

Sterility in the bull has been observed as caused by mechanical obstruction, such as tumors in the prepuce. A case of tuberculosis of the prepuce caused sterility by mechanical obstruction. Sterility has been caused by infection in the testicles and epididymis with *Bacterium tuberculosis*, *B. bipolaris*, and *Bact. abortus* (Bang.) Lack of development of the genital organs is a cause. A few cases in the bull have been observed in which the organs were apparently normally developed, but the spermatozoa only in head part, and had no tail portions, and therefore, were non-motile. We have a record of one case of this kind. A young bull had well covered forty-five cows and none of them had become pregnant. Microscopic examination of the semen revealed tailless spermatozoa. Other causes in the bull are phymosis, paraphymosis, paralysis of penis, rupture of the cavernous tissues of penis, priapism, fracture of the erected penis, proctitis and endocrine system unbalanced.

DIAGNOSIS

The diagnosis of sterility is usually established before the veterinarian is called to determine the cause. The veterinarian who claims to be expert in the diagnosis of conditions causative of sterility, besides having a fair knowledge of the normal genital tract, abnormalities and diseased conditions which may affect it, must be an expert in the diagnosis of the various stages of pregnancy. Cows which the history indicates have never been bred, upon examination, are frequently found to be pregnant. A mistake could be made by attempting to treat these cases without having previously examined them. Other cows, while pregnant, may show signs of estrum at regular or irregular intervals after conception has taken place. The history in these cases would indicate sterility while examination shows the animal to be pregnant. It is necessary to be able to establish a diagnosis of "pregnant" or "not pregnant" in cows which have been treated for sterility, have been bred, and have gone over several estral periods. Examination shows that a number of this class are not pregnant. Then we should look to the ovaries for the presence of a retained corpus luteum. Other cows which have been bred and conceived go beyond their normal parturition date without showing any signs of parturition. When such a cow has gone ten, eleven, twelve or possibly thirteen months, the attention of a veterinarian is called to the case. In these cases a diagnosis of mummified fetus is usually established.

The history and general appearance of the cow immediately establishes the diagnosis of nymphomania and indicates to the diagnostician that he is dealing with cystic ovaries and possibly cervicitis, salpingitis, etc.

Granular vaginitis and other diseases of the vagina are readily diagnosed by examination of that portion of the genital tract. Adhesions, tumors, abscesses, diseases of the ovaries, tubes, and, to a certain extent, diseases of the uterus, are diagnosed by rectal examination. Septic conditions of the uterus often require catheterization of that organ by the Albrechtsen method, before the diagnosis is definitely established. In all such cases, laboratory facilities should be taken advantage of when necessary to complete the diagnosis.

PATHOLOGY

Post-mortems of sterile animals show lesions corresponding to the list of abnormalities mentioned under causes. The uterus and uterine mucosa are subject to the same forms of inflammation as other similar tissues, and range from a simple catarrhal to a suppurative or even the chronic proliferative form; besides specific inflammation, such as tuberculosis. The uterine wall consists of three layers. The endometrium, including the glandular layer, is the most exposed and most subject to inflammation which is known as endometritis. Inflammation of the muscular layer is designated as myometritis and of the perimetrium as perimetritis. It is impossible to differentiate these forms clinically. Endometritis may be catarrhal, suppurative, ulcerative, hemorrhagic or all combined. Chronic forms of endometritis are inclined to become catarrhal.

In chronic endometritis there may be present:

1. Glandular hypertrophy. Uterine glands increased in size and abnormal in shape.
2. Glandular hyperplasia. Uterine glands increased in number at the expense of interglandular tissue.
3. Interstitial changes. Increase in connective tissue of the endometrium at the expense of the glandular elements. The connective tissue of the endometrium is changed from the normal embryonic type to mature fibres, which widely separate the glands.
4. Cystic endometritis. The outlet of some of the glands is closed and as a result, retention cysts are formed.
5. Polypoid endometritis. Interstitial changes in conjunc-

tion with glandular hypertrophy gives rise to the formation of mucous polyps.

In most all forms of uterine inflammation, the wall of the uterus becomes thickened. In the interstitial form due to the formation of fibrinous tissue which contracts, the wall is thinner than normal.

The ovaries show cystic degeneration, interstitial ovaritis with the formation of fibrous tissue, and may show a retained corpus luteum which is sometimes deeply seated and surrounded by fibrous tissue.

The abnormalities of the fallopian tubes may be acute or chronic catarrhal inflammations; hydrosalpinx and pyosalpinx.

Inflammations of the cervix are similar in nature to those found in the uterus proper. The external os frequently is enlarged in the form of a cauliflower-like growth. Septic conditions of the cervix, in exceptional cases, cause it to become dilated so that the cervical canal is more or less elliptical in shape. As much as three pints of pus, the formation of which was caused by a streptococcus, has been withdrawn from the cervical canal in one operation. Clinically, this case was diagnosed as pyometra. Bacteriological study showed the pus to contain a pure culture of a streptococcus.

PREVENTION AND TREATMENT

A large percentage of the conditions given as causes of sterility are secondary to some infective organism. In fact, most of the direct causes of sterility are secondary to some other primary cause. Therefore, in the treatment of sterility, it is often the secondary condition we must deal with while in prevention, which is more effective than treatment, we must deal with the primary cause.

Those who are engaged in an advisory capacity, should aim to give advice of a nature that will inform breeders of the best methods of keeping the reproductive functions normal.

The prevention of abortion disease will undoubtedly be the indirect means of preventing a large percentage of cases of sterility. It is my opinion that those who advocate the use of living-culture, bovine abortion vaccine, advocate additional troubles in the herds in which they are used. My experience up to the present time with the Pennsylvania Bureau of Animal Industry, in the use of living-culture bovine abortion vaccine, does not make me inclined to encourage its use. Experience

teaches that conditions are not bad enough in any herd to encourage or possibly to justify its use.

The encouragement of a study of methods of feeding cows under test for high records, with the object of correcting the incorrect methods, may become the means of preventing a number of cases of sterility. This is possible of accomplishment in the class of cows in which the sterility is apparently due to improper rations.

One who advises the removal from the herd of all cows showing a septic condition in any part of the body is giving advice of a nature which may be the means of preventing a number of cases of sterility later.

In the treatment of sterility the tendency is to overtreat. It is better not to treat at all or to treat too little than to treat too much. The genital organs individually or collectively are very delicate. In the female they are more or less a sympathetic group of organs or parts. It seems that if one part becomes severely affected, the other parts also become affected. By repeated irritation in treating too frequently, there is a tendency to set up chronic inflammation. In treating the abnormalities one must use judgment and treat whatever condition is presented. In septic endometritis the Albrechtsen uterine douche is indicated. It seems that better results are obtained by treating only every three or four weeks than when it is used more frequently. In cystic ovary cases, the cysts are broken occasionally by massage of the affected ovaries. Beneficial results are obtained in cows which fail to show signs of estrum for a long time by the administration of ovarian extract. In enlargement of the external cervix, it sometimes becomes necessary to remove excessive parts. Cows having unilateral salpingitis and a cystic ovary are sometimes benefited by the removal of the affected ovary and fallopian tube. Cases of perimetritis with adhesions are more likely to recover if turned on pasture for a period of five or six months and are not treated at all.

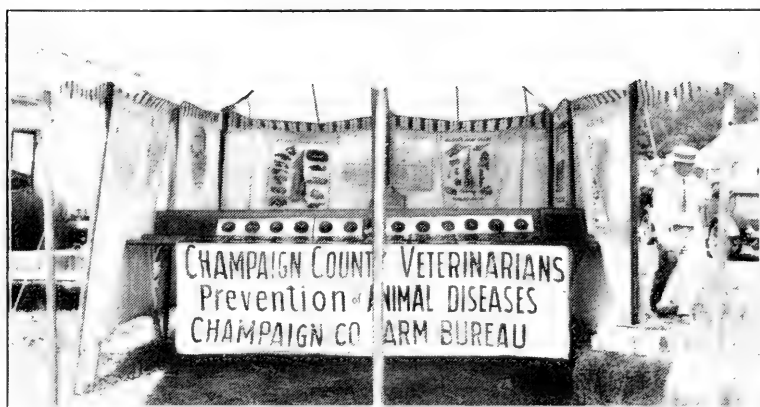
There is much to be learned in the field of endocrinology. It is my opinion that a number of the problems confronting us at this time with reference to sterility in cows will be more easily solved when the physiological action of extracts of the ductless glands have been thoroughly studied. This field of treatment should not be overdone to its destruction. Facts should be definitely established with reference to the physiological action or benefits which may be derived from their use before products

of ductless glands, either singly or in combination, are put on the market. Otherwise, they should be used only experimentally. This is a big, undeveloped field.

Most valuable advancement will have been made when the discovery has been made of something that will destroy *Bacterium abortus* (Bang) infection in the carrier cow.

A FINE IDEA

The accompanying photograph shows a view of the booth maintained at the recent Champaign County (Ill.) Fair. Dr. A. H. Davidson, formerly in practice at Hume, Illinois, and now county veterinarian, engaged in tuberculosis eradication work, was in charge of the booth. Dr. Davidson reports that over 250 of the leading breeders and farmers of the county



Booth of Champaign County, (Illinois) Veterinarians

visited this booth for the purpose of obtaining information relative to animal diseases. The expense in connection with the booth was borne by the nineteen veterinarians located in Champaign County, and cost them approximately two dollars each. The majority of them feel that the booth was a good thing. Dr. Davidson is entitled to considerable credit for the manner in which he had the booth arranged.

Success doesn't happen. It comes to those who are willing to work for it, study for it, and meet the obstacles that stand in the way of it.

AN OUTBREAK OF COW-POX, INTRODUCED BY VACCINATION, INVOLVING A HERD OF CATTLE AND A FAMILY¹

By Fred Boerner, Jr., Philadelphia, Pa.

On October 29, 1922, I was called to investigate an outbreak of cow-pox in a herd of cattle. The disease had originally been transmitted to the cattle through virus from human vaccination



Fig. 1. Pox Lesions on the Teats.

lesions, and later transmitted from the cattle to unvaccinated human beings. The outbreak is of sufficient interest to warrant its being reported.

The owner of the farm on which the outbreak occurred did not

¹Contribution from the Bureau of Animal Industry, Pennsylvania Department of Agriculture. New Series No. 13.

reside thereon, and the care of the herd was left to an employe who lived in the immediate neighborhood. This household consisted of the employe, his family and a colored helper. No cases developed in the owner's family, which consisted of two adults and two children, all of whom had previously been vaccinated.

The employe's family numbered five, the father, the mother and three children, all boys. In what follows, these will be respectively designated as Mr. M., Mrs. M., B. M., J. M., and W. M. The following is a brief history of each case, and it has been considered best to discuss them in chronological order.

J. M., age 6 years, was vaccinated on September 16th, 1922, successfully. He did not wear any shield and according to his parents was accustomed to scratching the lesion. He had one small lesion on his finger which left a scar. This lesion developed October 1st. He did not complain of any fever during the time this lesion developed but had a slight fever one morning during the time vaccine lesion was developing. Aside from going to school he helped his father milk the cows morning and night and was doing it while his arm was still sore from the vaccination.

B. M., age 13 years, was vaccinated September 16, 1922. Like his brother he wore no shield and was noticed picking and scratching the lesion quite often. He developed one lesion on his thigh and one on his wrist about the same time as his brother, October 1st. The lesions were small and healed up readily. He also helped to attend to the cows.

About the last of September one or two of the cows developed pox lesions on the teats. This condition spread through the herd, until at the time of our visit one month later nearly every animal showed lesions on the udder or teats in various stages of development. The lesions were typical for those described for cow-pox. Cattle had been added to this herd in the spring and in June and July, but they were said to have been free of the disease, at the time of their arrival and remained so until the time of the outbreak.

Mr. M., age 33 years, never vaccinated. He had one lesion on the face and a few small lesions on the arm and one on each thumb. He said the lesions first developed on his thumbs, one in particular, which he believes became infected through a knife wound. The date of its first appearance was the latter part of September or the first of October. One of Mr. M.'s duties was to take care of a herd of cattle numbering about forty, many of

which he milked morning and night. The disease did not manifest itself very severely in his case, as the lesions were small, and healed readily and were not in my mind as typical as exhibited in some of the other members of the family.

W. M., age 19 months, never vaccinated. On October 8th skin trouble developed on his face which the mother thought was eczema and which she treated herself. This condition



Fig. 2. Pox Lesions on the Face of Mrs. M.

cleared up in a couple of days. A week later, October 15th, pox lesions developed on his arms, five or six on the one arm and two or three on the other. The largest was one-fourth inch in diameter. Mrs. M. described it as appearing similar to her own case, first like a boil, which broke open, and the center ulcerated. The day of our visit these lesions seemed to be drying up with a hard scab.

Mrs. M., age 33 years, said she has never been vaccinated. It was the custom for one of the children, W. M., to sleep with his mother and she said that he usually had his arms around her neck. On Tuesday and Wednesday, October 17th and 18th, she had chills, fever and swollen glands and thought at the time she had caught cold. These symptoms subsided and six small pimples appeared on her face and on the 20th she claimed these were festered and looked somewhat like little boils which did not break until the following Wednesday and then started to ulcerate. At the time of my visit she had three lesions on the side of her face, one under the chin, one on the side of her chin and one directly in the middle of her chin. The edges were highly inflamed and greatly thickened, the center ulcerated, with crater appearance. The ones on the chin, which were the largest, appeared to be nearly an inch in diameter. The ones on the side of her face were smaller, probably a little less than an inch and were of the same appearance. The cheek was much swollen and reddened. We had a photograph taken of this case.

Helper (colored), age 24 years. Was vaccinated when he was 13 years old. Had lesion to develop on one hand, which was accompanied by some swelling of the arm. This subsided without lesions developing. The lesion on the hand was of fairly good size. Although we did not see this case, we were told that the lesion was the size of a dime. The helper also assisted in taking care of the cows.

DISCUSSION

It is difficult to determine definitely the source of infection in each of these cases, especially those which developed after the herd became infected. It can readily be seen that three of the family, as well as the colored helper, by milking the cows twice daily, contaminated their hands, and thus were in position to spread the virus directly or indirectly. It is suggested, however, that the following is the method by which the infection was spread.

The two sons, J. M. and B. M., were vaccinated September 16th, 1922. No shields were used and both were in the habit of rubbing and scratching the vaccine lesions. Their hands were thus contaminated and the infection transferred to the udders of the cows. The lesions on the body, wrist and thigh of one of the boys and on the wrist of the other, might have been caused by transference of the virus from the vaccine lesion or from the cows, through the intermedium of contaminated fingers.

The father was the next to become infected. In this case, the source was in all probability the cows, since the lesions appeared on the hands immediately after the disease appeared in the cattle.

The youngest child was accustomed to meet his father as the latter returned from work. The father usually took hold of the child's arm, and in this way doubtless infected it. It was the custom for the child to sleep with his arm around his mother's neck and this probably accounts for the lesions which shortly afterward appeared on her face.

This outbreak demonstrated clearly the dangers of transmitting cow-pox to cattle through the medium of vaccination, and that individuals recently vaccinated should not be permitted to handle dairy cows.

AN EPOCH MAKING INVENTION

The invention of a testing apparatus which accurately measures the pulling powers of horses and mules is the biggest thing that has ever happened in draft horse history. It will revolutionize breeding and permit the rapid development of a better class of draft animals. Sires will be chosen because of their worth, ascertained by actual performance.

The value of horses and mules in transporting commodities in cities and in general work on farms will be re-emphasized. With this invention it is possible to ascertain how much a team can pull without injury and to govern loads accordingly. Such an apparatus has been invented by E. V. Collins of the Agricultural Engineering Department of Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa. It is known as the horse and mule dynamometer. In tests with this machine at the Iowa State Fair, August 27, 28, 29, 1923, horses developed all the way from 8.6 horse power to 21.2 horse power and exerted a tractive pull of from 2000 to 2300 pounds.

Credit for this invention must go entirely to Mr. Collins, but the initiative came from the Horse Association of America; for it was the persistent pressure of this organization upon agricultural engineers to devise some means of measuring the pulling power of horses and mules that led to the studies which resulted as above noted.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

JIMSON WEED POISONING

By E. D. KING, JR., *Valdosta, Ga.*

The plant shown in the accompanying illustration is too well known to require description. The Jimson weed, *Datura stramonium*, is common in the United States and all tropical regions.

This plant was used in the examination for the graduation of the 1916 class at the Veterinary College at Auburn, Ala., being set up on the desk used by the examiner and the students told



Jimson Weed
(*Datura stramonium*)

to "name the plant in the bucket, give the poisonous principle it contains and describe symptoms of its poisoning" or words essentially to that effect.

The reason that this plant is brought to the attention of the profession is that it killed a mule here recently, in the opinion of the writer.

A team was loose in a lot surrounding a small saw-mill, and when the driver was ready to hitch up the team to take a load of lumber to town he found one mule very sick, and called a local veterinarian who could not go, but told him that if the trouble was as the driver suspected (arsenical poisoning, from a dipping vat in an adjoining lot, close to the fence, with a small puddle overflowed in the mill lot) to give as an emergency treatment one teaspoonful of ferrous sulphate (this usually being kept on most premises.)

Later an urgent request was made that the veterinarian come out and see the mule, which was done, with result that the animal was found to be suffering from some narcotic instead of arsenical poisoning, pupils dilated, breathing labored, pulse absent, submaxillary veins greatly dilated, and mule walking backwards. It was seen that nothing could be done and immediate search was made for poisonous plants. Several Jimson weeds were found that had been bitten off and one practically eaten up.

Tracks of the mule (or the other one in the lot) were demonstrated passing by the puddle, supposedly of arsenical solution, but they passed straight by, with no interruption in the intervals of the tracks, and this animal could not have drunk out of the puddle unless he turned the front of the hoofs toward the puddle, which was not done.

In my paper published in the JOURNAL, June, 1920, Vol. LVII, New Series Vol. 10, No. 3, all possible emphasis was placed on this subject, and it is hoped that this may serve to interest, to some extent, those who have time and opportunity to study plant poisoning more.

A RADICAL OPERATION FOR NASAL SARCOMA IN A MULE

By J. E. AGHION, Sahka, Egypt

Principal Veterinary Officer, State Domains

The photograph which is here produced illustrates a case of nasal sarcoma, which for reason of its rarity, I propose to deal with in this short paper.

A grey mule, nearly five years old, of Syrian origin, property of Mostapha eff. Dawoud of Dessouk District, was sent to me for examination on June 1, 1917.

Symptoms observed were as follows: Emaciation, difficult breathing, snoring sound and dyspnea, when the animal was made to trot; muco-purulent discharge of a fetid odor from the left nostril and eye; tender swelling of the nasal bones. On closer examination the orbital fossa and turbinated bones were seen to be invaded by a tumor, which, while projecting outwards, blocked the whole of the left nostril and by reason of its enormous size was pressing on the bones of the maxillary sinuses on one side, and on the other pressing against the septum nasi, causing a projection on its other side, thus blocking totally the left nasal chamber and partly the right.

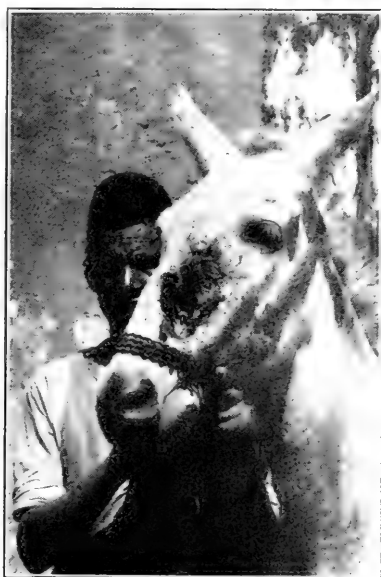
Trephining the maxillary bones was attempted, but failed to give satisfaction on account of the size of the tumor which was certainly unlike that of a nasal polypus.

The case was provisionally diagnosed as sarcoma of the turbinated bone. A radical removal of the whole tumor was suggested and carried out with the consent of the owner. The animal was prepared for operation on June 3, 1917. It was cast in a lateral position (on a heavy bedding) and in order to prevent blood entering the trachea, the head was lifted upwards by an assistant as much as possible.

The seat of operation was shaved, washed and disinfected, and a local anesthetic was given, after which a longitudinal incision, close to the middle line, was made from above downwards right over the most prominent portion of the swelling and parallel to the nasal bone, nearly 10 c. m. in length. Then two other oblique incisions, one crossing the top of the longitudinal incision, the other crossing its bottom, thus making the shape of a capital I. The skin was carefully dissected and the levator labii muscle separated. The maxillary bones, being diseased, were soft and easily cut with the knife; then they were carefully removed, exposing the nasal chamber and the tumor. The tumor (most probably sarcoma) was firmly adherent to the turbinated bone. I then had no alternative but to remove the tumor, together with the turbinated bone. The cavity of the tumor was curetted and cauterized with a solution of fuming sulphuric acid. The hemorrhage was controlled chiefly by sponging the shneiderian membrane from time to time during the operation with a solution of adrenalin chloride, the larger vessels being secured by artery forceps.

The whole cavity was then irrigated with a solution of chinosol, painted with iodine and packed with gauze. The skin was su-

tured. Daily irrigation was continued for about three weeks, during which the animal was doing well and the wound was healing satisfactorily. The animal was sent to the owner with instructions to have it sent twice a week for dressing. Now owing to the irritation of the skin, produced during the process of granulation, the animal was unluckily found loose in the stable one night thirty days after the operation, rubbing himself against the manger and producing bleeding of the nostrils and tearing of the skin immediately over the seat of operation, leaving it a bare open gap as seen in the photo.



Nasal Sarcoma

The operation I believe would have been a success if it had not been for this accident. The animal was treated for six months afterwards and the last time I had the chance to see him the wound opening was only as large as an opening of a small trephine or the size of a millieme.

It is sometimes a good thing to be the lowest spoke in the wheel. Whichever way it turns it's bound to go up.

REVIEW

DIAGNOSIS AND TREATMENT OF INTERNAL PARASITES. Maurice C. Hall, Ph. D., D. V. M., Senior Zoologist, U. S. Department of Agriculture. 92 pages and over 100 illustrations. Published by Veterinary Medicine, Chicago, Ill., 1923. Cloth, \$1.50.

This is the first of a series of books on parasitology of domestic animals to be offered by the publishers of Veterinary Medicine. According to an announcement of the publishers, the entire series will cover about three thousand pages.

The volume is divided into ten chapters. The first two chapters deal with the methods of collecting parasites from various organs and with the technic of fecal examinations. The following five chapters are devoted to a consideration of eggs and larvae of parasites from various domestic animals in the following order: dogs, cats and foxes; swine; cattle, sheep and goats; horses; poultry. Over a hundred eggs and larvae are described and illustrated with the best figures available in the literature on parasitology. The next chapter deals with spurious parasites in the feces of animals and considers among other things such forms as yeasts, microscopic seeds, spores, and other vegetable forms that superficially resemble the ova of helminths and that are frequently confusing to the inexperienced microscopist. This chapter is amply illustrated. The next two chapters deal with anthelmintics, a field in which the author of the book has come to be recognized as the foremost authority.

Following a general consideration of anthelmintic medication there follow directions for the treatment of domestic animals, for internal parasites, in the following order: Treatment for (1) horse parasites, (2) cattle parasites, (3) sheep and goat parasites, (4) swine parasites, (5) dog parasites, (6) cat parasites, (7) fox parasites, (8) poultry parasites. Dr. Hall's expert knowledge of anthelmintic medication, based on his own painstaking work and on the work of others, would make any comment on that phase of the book superfluous.

The book is singularly free from typographical errors, is profusely illustrated and is exceedingly well written. Not only veterinarians and animal husbandmen, but also zoologists and physicians will find Dr. Hall's volume a valuable aid and will await with interest the appearance of the succeeding issues of the proposed series.

B. S.

ABSTRACTS

THE DETECTION OF WORM EGGS IN FECES OF ANIMALS AND SOME EXPERIMENTS IN THE TREATMENT OF PARASITIC GASTRITIS IN CATTLE. Sheather, A. L. Jour. Comp. Path. and Thera., xxxvi (1923), p. 71.

The paper, as the title indicates, is divided into two parts. In the first a rapid method is described for examining feces of animals. Briefly the procedure may be described as follows: The feces are suspended in water, strained through wire gauze (30 meshes to inch), the strained suspension added to an equal volume of sugar solution (sugar 1 lb., water $\frac{3}{4}$ of pint) and centrifuged rapidly. Cover slips are lowered on the surface of the centrifuged liquid and gently withdrawn and placed on a slide and examined.

The second portion of the paper considers the treatment of parasitic gastritis of calves, six to nine months old, caused by *Ostertagia ostertagi*. Turpentine used in doses of two ounces and given in milk and linseed oil was not effective. Copper sulphate in doses of twelve grams, either alone or when administered with 1 to 5 grams of sodium arsenate, did not prove fatal to the worms. Tartar emetic given in a dose of sixteen grams was without effect. The writer states that, "Carbon tetrachloride was found not only useless for the treatment of the disease, but actually poisonous in a dose of 25 cc."

F. S. J.

ETIOLOGY OF SPONTANEOUS ULCER OF THE STOMACH IN DOMESTIC ANIMALS. Edward C. Rosenow. Jour. Inf. Dis., xxxii, (1923), 384.

In his studies on ulcer of the stomach in man the author was able to isolate from the ulcers and from the foci of infection a streptococcus which, when injected into experimental animals, produced ulcer of the stomach. In man the most common foci of infection were the tonsils and the teeth.

Carrying on this work in the domestic animals large numbers of calves, cows, sheep and dogs were examined. Streptococci were isolated in pure cultures, or in predominating numbers from a series of ulcers in these animals. The organisms could

also be found in the tissues where the number seemed to vary proportional to the acuteness of the condition.

Ulcers, hemorrhage, and infiltration of the stomach were produced in 86% of rabbits and dogs injected with the freshly isolated cultures from ulcers in the different species, often times showing no other lesions.

Streptococci were demonstrated in and isolated from these experimentally produced ulcers and they, in turn, when injected into animals, produced ulcer. Two of these strains so isolated and preserved in ascites-glucose-agar shake cultures, covered with oil, retained their specific localizing powers for 7½ years.

The injection of streptococci of similar morphology, but from sources other than ulcer, failed to give similar results.

The writer concludes that ulcer of the stomach in animals is, as in man, apparently often due to localized, blood-borne infection by streptococci which have a selective affinity for the mucous membrane, or other parts of the stomach.

S. S.

EXPERIMENTS ON THE DISINFECTION OF SPERM IN MAMMALS, ESPECIALLY IN RELATION TO DOURINE IN HORSES. E. Iwanow. *Parasitology* (Cambridge, Eng.), xv (1923), 2, pp. 122-127.

Sperm disinfection is of practical value in horse breeding, since dourine is very prevalent in some countries and valuable stallions may have to be retired from a stud owing to infection with this disease. Experiments in disinfection, to determine means of destroying parasites without injuring the sperm, indicated that physical methods were not promising. Radium was harmful to sperm and ultraviolet rays seemed to have inadequate penetrating powers. Some chemicals, including alcohol and atoxyl, were found unsatisfactory, but good results were obtained with salvarsan and neosalvarsan. The author recommends that prior to coitus the vagina of mares be washed with physiological salt solution containing salvarsan or neosalvarsan, 1:10,000, and that the penis of stallions be washed with an aqueous solution of the same strength after coitus. As another measure he recommends artificial insemination with the addition of the salvarsan or neosalvarsan solution to the sperm. As a prophylactic measure an ointment containing salvarsan, 1:10,000, may be used.

M. C. H.

AMERICAN VETERINARY MEDICAL ASSOCIATION

**Proceedings of Sixtieth Annual Meeting, Montreal,
Canada. August 27 to 31, 1923.**

MONDAY MORNING, August 27, 1923

The sixtieth annual meeting of the American Veterinary Medical Association convened at 10:45 a. m., in the Banquet Room, Mount Royal Hotel, Montreal, Canada, President W. H. Welch presiding.

PRESIDENT WELCH: I will declare the Association in order. In the absence of the Mayor, Alderman Leon Trepanier will deliver the address of welcome, acting for the Mayor of Montreal. (Applause).

ALDERMAN TREPANIER: Mr. President, Ladies and Gentlemen: It affords me a great pleasure to extend to you all a most cordial welcome to our city. I must say, Mr. President, that we have had this year quite a few conventions, but this convention of the American Veterinary Medical Association is a most unusual one for the City of Montreal. You have been kind enough to choose our city for the seat of your Diamond Jubilee meeting, and we are really proud of it, and we thank you very much.

There is an impression among, well, I would say the prominent public, that a veterinarian is a man who looks only after the maintenance of the life of domestic animals. Our common people think that a veterinarian has only a few notions of anatomy or zoology, and that he does not go very deeply into studies which regard human life. Well, gentlemen, I hope that after your deliberations some of our people who are under that false impression will have another impression, because we know that the distinguished members of this Association will go very deeply into the studies which may lead to improving and maybe prolonging human life.

We are very fortunate in having on the City Council, as one of my colleagues, a member of your Association, our good friend, Alderman Genereux, whom I would ask to stand up so that everybody will see him.

. . . Dr Genereux arose. . . (Applause).

Dr. Genereux belongs to a generation which is a little older than mine. That accounts perhaps for the little disagreements we have, sometimes, about financial matters, because we young-

sters of the City Council are always ready to dissipate public funds, while Dr. Genereux, who belongs to the more thrifty generation, is always there to stop those dangerous youngsters. (Laughter) But there was a moment not very long ago, ladies and gentlemen, when Dr. Genereux and I were of the very same opinion. It was when, as Chairman of the Reception Committee, he came before the Council and thought that the City of Montreal, even if it went to the very limit of its very restricted budget, to welcome the members of the American Veterinary Medical Association, even then the City of Montreal would not do enough, and I was of the very same opinion. That is the only time we agreed. (Laughter and applause)

Ladies and gentlemen, I wish to extend a special welcome to some of the distinguished members of this Association, especially to the eminent medical man from South Africa, who left that remote land to be with you here today; to the distinguished French visitor who will be here tomorrow; to the distinguished men from Cuba and Santo Domingo; and of course, to all our friends from the great American Republic.

As to the city of Montreal, I do not want to go very deeply into the history of our city, but I believe you are in a city which has a very unique character. Though we are the metropolis of the largest British colony, Montreal is the third largest French city in the world. Out of a population of nearly 800,000, the French-speaking element numbers over 600,000. The Province of Quebec is seven-eighths French-speaking origin, and I wish here to dissipate an impression which many visitors have about the French that we speak here in the Province of Quebec.

You know there are a great many of our American friends who have been a few weeks in Paris or Marseilles or Lyons and who are under the impression we do not speak what they call the Parisian French. There is nothing known as the Parisian French. There is but one French language in the world, and it is the one spoken and adopted by the French Academy in France, and the French spoken in the Province of Quebec, and all through Canada, by the two millions and a half British citizens of French origin is the French language, the one which we have inherited from the noblemen of the seventeenth century who came to our shores, developed this country and who gave us heritage, to the sixty thousand French settlers who were left here under the British domination, their language, their customs and their faith.

Ladies and gentlemen, if you cross the threshold of our French-Canadian peasants' homes in the rural districts, you may hear there the same melodious songs and lullabies, which were sung by our great grandmothers of France, in the seventeenth century, on the old land of France.

We are, in this Province of Quebec and the City of Montreal, we citizens of French descent, jealous of our rights, of our language, of our faith, of our customs, but we are also most loyal subjects of Great Britain, and we are proud to say it. Our loyalty has been submitted many a time to very severe tests and I do not want to recall but one incident in American history, for it is only history, I may say here, that when the American revolution started, when the old Chateau de Ramezay, which you will probably see tomorrow or day after tomorrow, was inhabited by American invaders, when proclamations were launched calling upon the French-Canadians to cease their allegiance to Great Britain and join the Americans, well, the French-Canadians remained loyal to Great Britain.

Still, as I said a few minutes ago, we are jealous of our rights, of our language, of our faith and the motto of the Province, which is, "*Je me souviens*;" that is, "I remember," which means that "I remember my language, I remember my faith, I remember the customs of the old France."

Ladies and gentlemen, there is one little point on which I desire to touch, too. It is that famous question of liquor in the Province of Quebec. (Laughter) I know that this Montreal has not been chosen for your convention on account of that famous temperance question, but I want to dissipate a very false impression about that famous liquor question in our Province.

The first thing is, we don't call it the "liquor" question, we call it the "temperance" question, because our new laws have practically imposed temperance in this Province. Of course, our history is founded on individual freedom and liberty and that is why we never had any idea of imposing the "Volstead" system, the system dear to Mr. Volstead and Company, right here in our Province of Quebec, (laughter) but our temperance question—we have the liquor under government control and the profits derived out of the sale of liquor in the Province of Quebec go entirely to hospitals, the foundation of homes, the improvement of education, the advancement of science, arts and medicine, and two years ago, at the end of the first fiscal year, the Pro-

vincial government put at the disposal of such noble things more than four millions of dollars. This week about ten of our young men, young medical men, musicians, artists, will leave Montreal to go to England and to France, to advance their studies, to improve their knowledge, thanks to that famous liquor of the Province of Quebec.

A very striking fact, also, ladies and gentlemen, is, since we have had our temperance law, cases of drunkenness have been reduced, from year to year, in the city of Montreal and today, though we have liquor in every government store, everywhere, in every hotel and every house, you can not see a drunken man on the streets. This is the liquor law in the Province of Quebec, and I am sure you won't abuse our good temperance law.

Montreal is a city, as I said, of an unusual character. We are the terminus of the two largest railways in Canada, the C. P. R. and the Canadian National Railways. We are also the national port of the Dominion. We have museums, libraries, educational institutions; we have two universities, English-speaking and French-speaking universities, and we have what we cherish the most, our old historical landmarks.

There is another convention opening this morning, of the American Numismatic Association, at Chateau de Ramezay. There has been published a pamphlet by the local press, in both languages, a very interesting pamphlet, which is being distributed free to the members of the American Numismatic Association, and I would invite the organizers of this convention to get a few hundred of those pamphlets and distribute them free to the visitors whom we have here today.

Now, ladies and gentlemen, I don't want to be very long. I am only replacing His Worship, the Mayor. He is a more prolific speaker than I am, and if he had been here, it would have been very much more interesting, but still I want to reiterate a most cordial welcome to you, and if Dr. Genereux finds the City of Montreal is not doing enough, let him come before us this week and tell us to spend more money than we are. (Applause)

PRESIDENT WELCH: Dr. L. A. Merillat, of Chicago, will respond. (Applause).

DR. MERILLAT: Mr. President, Ladies and Gentlemen: The address of welcome just delivered in behalf of the Mayor of Montreal imposes quite a responsibility on any one who would attempt to find words of reply. In fact, I have considerable

misgivings about my repartee, to reply to each of the features of his remarkable words of welcome.

I want to assure your Honor, however, that Montreal is not new to any of us. This is not a new city. Now, I am not thinking about what some of you are—I am thinking about the veterinary business and not the liquor business. (Laughter) I am very glad that His Honor has mentioned that particular feature about selecting Montreal as a convention city, and I want to assure him that not a single man here has come for that purpose, but I do not think that that spoiled the attendance any. (Laughter)

I am thinking of Montreal from an entirely different standpoint. All veterinarians can not help but have a great deal of reverence for Montreal. Montreal is the cradle of the veterinary profession in the Western Hemisphere. Expressing it in French, "Montreal est le berceau de nos travail."

It is here that the first, orderly, highly-rated veterinary school was established on this continent, and it is here in Canada that education on the Western Hemisphere received its impetus.

You may be interested in knowing that veterinary education is purely French in origin. Not so many years ago, in fact, just exactly 160 years ago, Claude Bourgelat, a musketeer of Lyons, under King Louis XV, established the first veterinary school in history. The first attempt to do any public instruction, to carry out a curriculum in veterinary science, to establish a profession, in other words, began on that day and date, and that institution your Honor, is existing today and Professor Porcher, a good friend whom I chanced to meet in Paris during my sojourn there, is a professor of that institution.

That is one reason why Montreal is important to veterinary science. More than that, the school established by Bourgelat yielded another distinguished man, not much known in veterinary history, Charles Vial. Few men know Charles Vial. He was a graduate of Lyons, and a demonstrator of anatomy under Bourgelat, but he was a little bit sore about the way his colleagues were treating him in regard to promotions, and he migrated to London and started the Royal College of England. You see, it was a Frenchman, after all, who started the thing going in our language.

In 1790, the Veterinary College of London was established, and this in a few years became the Royal College. The history of

veterinary science from that time on is household information to all of you. These schools, the Royal College of London, of Glasgow, of Dublin, the Royal (Dick) School, begat the men who carried veterinary science to this continent, with one exception. Oxford yielded Liautard.

The four pioneers are Professor Andrew Smith, who established the Veterinary School of Toronto; Professor Duncan McEachran, who might have been here this morning, but I understand is indisposed; Professor James Law, who established veterinary education in New York, and then our great Liautard, who established the first orderly education in the United States.

These are the four pioneers in veterinary education in this country, but it was Montreal, it was Toronto, that led and consequently, we feel very proud to have selected this place to celebrate this Diamond Jubilee, and I am sure that it is these facts that dominated a great deal in making this selection.

With these few words, I deliver to you, to your custody, the welfare and comfort of these delicate looking gentlemen during the next two or three days. Thank you very kindly. (Applause)

. . . . President Welch delivered his address. Published in this issue, p. 8. . . (Applause).

DR. N. S. MAYO: I move that the President's Address be referred to the Executive Committee for their consideration.

. . . . The motion was seconded by Dr. Kiernan and carried. . . .

DR. EICHHORN: In the address of welcome, mention was made of the fact that we have with us on this occasion representatives of foreign continents. Among those from South Africa is one who has probably contributed more towards the advancement of veterinary science, especially in the control of and research in tropical diseases, than any one else in the world. The veterinary profession is indeed very proud that we have this celebrity with us, and I suggest, Mr. President, that Sir Arnold Theiler, one of the best known men of the veterinary profession in the world, should be asked to deliberate with us at our sessions, as we are sure that every one will benefit from his opinions, and I further suggest that he be escorted to the platform, that every one of you may have the pleasure of meeting him. (Applause).

PRESIDENT WELCH: I will ask Dr. Watson and Dr. Eichhorn to escort Sir Arnold Theiler to the front.

. . . The audience arose and applauded as Sir Arnold was escorted to the platform. . . .

DR. THEILER: Mr. President, Ladies and Gentlemen: It affords me a great pleasure to be here among you Canadians and Americans. I have been looking forward for this trip for many a year. I was prevented from doing so on the last occasion through ill health. I took the first opportunity to come over to these great countries of yours and meet my colleagues in this part of the world. My work, as Professor Eichhorn has pointed out, has mostly been in tropical diseases, of Africa in general. It is quite true that we have made a considerable success, but certainly it was due to a great extent to the great work which was done in America, and also in that disease which the President has mentioned, Texas fever, which has opened the door for further investigation in the tropical diseases, of Africa in general. It is through American science that success was possible in the tropics.

Ladies and Gentlemen, I thank you most heartily for the welcome which you have given to me. I was told that Americans are hospitable; I was told that I would be welcome, but your reception has surpassed anything that I had a right to expect. Mr. President, Ladies and Gentlemen, I thank you from the bottom of my heart for the kindness and the good reception you have given me. (Applause)

PRESIDENT WELCH: Gentlemen, the matter of the presentation and adoption of the minutes of the previous meeting is now in order.

SECRETARY HOSKINS: Mr. President and Members: I have here the numbers of our official JOURNAL which contain the minutes of the meeting held in St. Louis last year, and I would present them to the Association as the official record of that meeting.

DR. MAYO: Mr. President, I move that the report of the Secretary be accepted.

. . . The motion was seconded by Dr. Kiernan and carried. . . .

. . . The meeting adjourned at 12:30 p. m., on motion of Dr. Mayo, duly seconded. . . .

ADJOURNMENT

(To be continued)

OTHER MEETINGS

MASSACHUSETTS VETERINARY MEDICAL ASSOCIATION

The regular monthly meeting of the Massachusetts Veterinary Medical Association was held at the New American House, in Boston, on June 27, 1923. The meeting was called to order at 5:45 by President Thayer. The following members were present: Drs. Pierce, White, Paquin, Bricault, Thayer, Playdon, Howard, Gilbert, Boutell and Carroll.

The records of the previous meeting were read and approved.

The committee appointed to investigate the reasons why we were not included on the list invited to the Springfield Conference of the Massachusetts Public Health Council reported and the report was accepted. The motion that the Secretary be instructed to make application for membership in the Massachusetts Central Health Council, and to inclose a check covering the amount of the fee, was made by Dr. Paquin, seconded by Dr. Pierce, and carried.

The membership application of Dr. Thomas Schinkwin was read, and laid on the table for the next monthly meeting.

Committee appointed on the resolutions of the death of Dr. Henry Elisha Page consisted of Drs. L. H. Howard, L. A. Paquin and W. T. White.

It was then moved by Dr. Pierce that a committee of two be appointed to gain the necessary information concerning rates, and various routes on the railroads to Montreal, for the annual convention of the American Veterinary Medical Association and to distribute the same to members of that association. The committee was appointed as follows: Drs. C. H. Playdon and H. W. Pierce.

A suggestion was made that a meeting of the Entertainment Committee be called on Monday, July 2nd, to arrange for the September meeting, to be held in Springfield, Mass. The Secretary would notify the same.

Dr. Thayer, President, reported that Dr. J. B. Lentz, of Amherst, suggested a Massachusetts, if possible, or a New England Clinic, to be held at Amherst for some future meeting.

The motion that the Secretary write to Dr. Lentz, thanking him for the offer, and that the matter be taken up again in the near future, was made by Dr. Paquin, seconded by Dr. Gilbert, and carried.

The meeting adjourned at 7:45.

C. H. PLAYDON, *Secretary*.

NORTH CAROLINA STATE VETERINARY MEDICAL ASSOCIATION

What is conceded to be the best meeting of the North Carolina State Veterinary Medical Association, since its organization, was that held in the Vance Hotel, Statesville, N. C., June 27-28, 1923. This, the twenty-second annual meeting, was presided over by the President, Dr. J. S. Dorton, of Shelby.

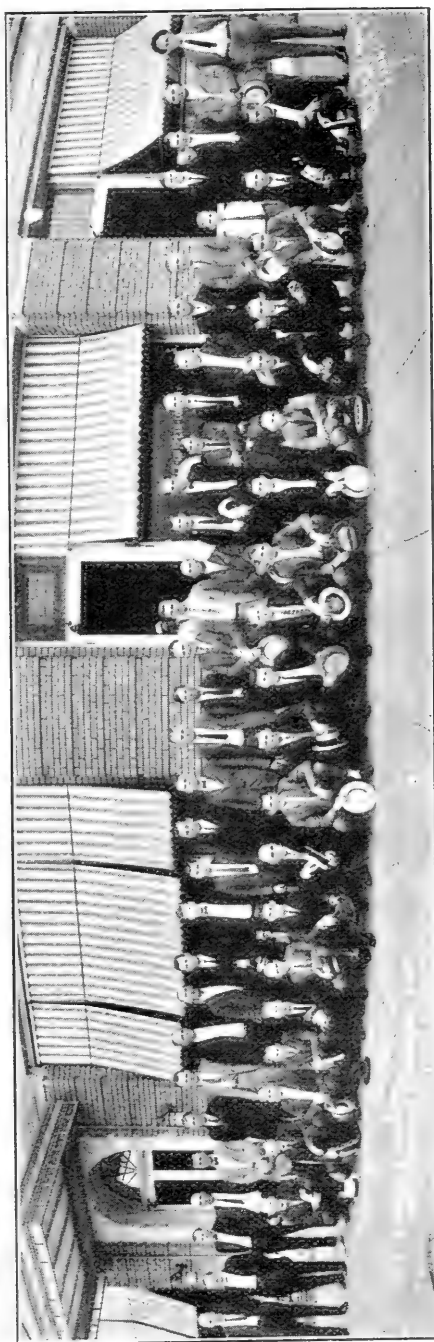
The more than forty veterinarians present were welcomed by the Mayor, Hon. L. B. Bristol, who complimented very highly the work of our organization and the character of its membership and Mr. W. H. Morrison, President of the Merchants' Association, who gave a short history of that organization and the good work it has done in getting reduced freight rates, regulating profits, etc. Response to these addresses was made by Dr. H. J. Rollins, of Rockingham.

Following the order of the program, Dr. M. M. Dew, of Wilson, read a paper on "Post-Mortem Technique," in which he gave a detailed description of this examination of the carcass.

"Rearing and Mating Dogs" was the subject of a paper prepared and read by Dr. S. A. Alexander, of Monroe. He discussed the types and breeds, and several of the more common diseases and their treatment. "Fright disease" was one ailment mentioned, which brought out quite a little discussion, since practically every veterinarian present has had various experiences treating it. Dr. J. C. Flynn, of Kansas City, Mo., one of our foremost authorities on diseases of small animals, attributes the disease to some kind of poisoning. He had been able to produce the disease by feeding certain dog biscuits.

Mr. C. C. Demaree, of the Asheville Health Department, read a paper on "Milk Hygiene," making his discussion mainly from the standpoint of the laboratory man. The milking machine is alright when used under favorable conditions, he said. However, of the one hundred seventy dairies around Asheville, only two use them. Some have found them injurious to the udders.

"Municipal Meat and Milk Inspection" was the title of a paper read by Dr. A. C. Jones, of High Point. He handled the subject from the standpoint of the inspector in the field. He referred to bacteria as dirt. The dairyman can see dirt but he cannot see bacteria. Show him something he can see. He urged the use of the small-top milk-pail, pointing out that the smaller the opening the smaller the target for foreign matter.



Members of North Carolina State Veterinary Medical Association and visitors in attendance at Statesville, N. C., June 27-28, 1923.

He urged the inspectors to be constructive, rather than destructive; to educate the dairyman by gradual innovations and to make friends with him. The dairyman should be made to realize the importance of his product and work to the health of the general public.

In discussing these papers, Dr. S. A. Nathan, of Chapel Hill, held out for strict enforcement of the health laws, advocating the withdrawal of licenses, when dairymen fail to meet the standards, that the public health was too important a consideration for compromises. Dr. L. F. Koonce encouraged the keeping of old dairymen in business by helping them and not putting so many new ones in business.

Dr. M. J. Ragland, of Salisbury, advocated educating the customer as well as the dairyman. Dr. W. T. Scarboro, of Raleigh, advised publishing the bacterial score and getting both producer and consumer to cooperate for mutual benefit. Dr. W. A. Hornaday, of Greensboro, advised helping the dairyman build up to the standard.

According to Dr. C. A. Cary, Dean of the Veterinary Department of the Alabama Polytechnic Institute, Auburn, Ala., speaking on "Conditions Facing the American Veterinarian," he said that machinery will never do away with the mule on the farm or in war. The prospect for the veterinarian was never brighter than it is now, because there is more work to do and fewer veterinarians to do it. The prestige of the profession depends on the character of the rank and file of the practitioners, hence the future of the Association depends upon them. He urged the members to interest themselves in whatever animal industries their clients are interested in. He also urged them to demonstrate to students the necessity of a full college course and to join in a concerted effort to wipe out the veterinary correspondence schools.

The veterinarians, extension workers and medical men must come together and define their spheres of usefulness, he said. The veterinarian should keep his place in sanitary control work. Let every other man have his place. Keep his friendship and you can get what you want and what rightfully belongs to you. He predicted that it is only a matter of time until every town will have meat inspection.

"The principles that govern our relations to our fellow men are the same in every profession," began Dr. Dorman Thompson, in addressing the Association on "Ethics in Veterinary Practice."

"The distinction between the ethics of the professional and the business man is fast becoming obliterated, I am glad to say. The old idea of every man for himself and the devil take the hindmost is outworn. I do not presume that I shall say anything new to you, but there is value in repetition. Iteration and reiteration, line upon line, precept upon precept, example upon example, is the way we march forward.

"Every man should take a pride in his profession. If he is not proud of it, he should quit it. No man who places the economic consideration first can be truly representative of his profession. Making a living is important, but it is only incidental to life. Those who have accomplished the most, who have risen highest, are not the men who made the most money out of their profession.

"You cannot live to yourselves; you should take an interest in the life of your community. A man must first be a good citizen to be representative to his profession. Be honest with yourself and with your fellow men. It should be the purpose of every man to put more in than he takes out of a community. The life of the professional man, as of every other man, should be a constant warfare against selfishness. The old Hebrew prophet, Micah, has given us the basis for a code of ethics that will stand for all time: 'The Lord hath showed, O man, what is good, and that the Lord doth require of thee to do justly, and to love mercy and to walk humbly before Thy God.'

"If the campaign against bovine tuberculosis in North Carolina is maintained at the present rate, it will be eradicated within five or six years," was the assertion of Dr. A. J. DeFossett, Chief of Tuberculosis Eradication in North Carolina. "There is less tuberculosis here than in the northern and western states, hence the time is coming when live stock men from those sections will come here to buy clean, healthy cattle. North Carolina is to be congratulated for taking the lead in tuberculosis eradication. In Vermont 21% of the cattle are tubercular. Seven out of every one hundred children who die of tuberculosis, contract it through the medium of milk, hence the importance of tuberculosis eradication."

According to Dr. T. P. White, Assistant Chief of the Division of Hog Cholera Control Work, Washington, D. C., cholera still remains the greatest menace to the swine industry. The annual, national loss approximates \$30,000,000.00, with an additional cost of nearly \$10,000,000.00 for serum and the service of veterinarians. The serum treatment to young pigs does not give per-

manent immunity. However, pigs simultaneously treated while weighing from fifty to seventy pounds remain permanently immune. Fresh serum is best.

Dr. F. B. Owen, of Raleigh, who is in charge of Hog Cholera Control Work in North Carolina, assured the veterinarians that he and his men are ready at all times to aid local veterinarians in controlling any outbreak of cholera that may be reported to his office. Dr. M. Jacob, of Knoxville, Tenn., advocated the use of oxygen in preference to the air treatment in parturient paresis. He had also used it, with excellent results, in treatment of stricture of teats, this being preferable to surgical treatment. This treatment has also been used in the human female to the extent of saving life.

In discussing veterinary purgatives, Dr. R. H. Parker, of Gastonia, said aloes, used alone, is the best purgative for the horse and hog. He said Epsom salts are the best for cattle, except in cases of low-blood-pressure.

"Some Legal Facts Pertaining to Veterinary Medicine" was the subject of a paper by Dr. William Moore, North Carolina State Veterinarian, of Raleigh. Many of those present used this opportunity to get information pertaining to their interests.

Prof. R. H. Ruffner, Professor of Animal Husbandry and Dairying, at State College, Raleigh, N. C., in discussing the "Live Stock Industry of North Carolina," said 90% of our 260,000 mules, the most valuable live stock in the state, are raised in other states. These mules have a value of \$128.00 per head. We should encourage the raising of more of these animals at home and thus save the nearly five millions of dollars spent each year for them in other states.

Horses come second with a value of \$108 each. Of these animals we produce about one-fourth, or 41,500. There is an increasing demand for horses which is shown by the fact that during January 80% more horses passed through sixty-seven of our principal live stock markets than during the same period a year ago.

Our third class of animals, in value, is swine, which reaches the figure of \$16,904,000. Prof. Ruffner urged that veterinarians raise a few pure-bred hogs and exhibit them at fairs and thus help to dispel the idea of the average farmer, that a veterinarian knows nothing about a hog.

The cow stands fourth in valuation at the low figure of \$39 per head. This should be the most profitable animal on the farm.

Encourage the farmer with all your possible help in breeding and feeding to make it so. Encourage live stock exhibits at county and state fairs and pure-bred live stock sales. It is at these places that many new interests are created.

Dr. J. C. Flynn, of Kansas City, Mo., held the attention of each veterinarian present when he responded to the call to discuss "Small Animal Practice." In response to several requests, he gave a description of his own hospital, its equipment and several methods used in handling various patients. He gave a short history of this line of veterinary work as it has developed during the past fourteen years, showing that it has made remarkable progress. He referred to small animal practice as the "life saver" of the profession. He then discussed black tongue, different forms of mange and treatment for same; rabies, distemper, chorea, etc.

Among the interesting things presented at the clinic, held in Dr. C. L. Cruse's Hospital, was an ovariectomy operation on a bitch, with small opening in abdominal wall, and castration of a cat without restraint, by Dr. Flynn. Dr. R. H. Parker, of Gastonia, performed a cesarean section operation on a sow. Dr. W. C. Dendinger, of Goldsboro, held an autopsy on a cow that had reacted to the tuberculin test.

The evening session of the first day was featured by a banquet that was enjoyed by many ladies and more than fifty veterinarians. Dr. C. A. Cary acted as toastmaster for this occasion. Immediately following the banquet a business session was held, at which time the Secretary-Treasurer's report was read and accepted.

Dr. M. J. Ragland, of Salisbury, was recommended to Governor Cameron Morrison for re-appointment as a member of the State Veterinary Examining Board, for a period of five years. Drs. J. G. Sallade and B. E. Moore were elected to active membership in the Association.

Blowing Rock was selected as the meeting place for the annual meeting that is to be held the last Wednesday in June, 1924. A motion was passed to the effect that this Association hold a special session with the Southeastern States Veterinary Medical Association meeting, in Greensboro, November, 12-13, 1923.

Election of officers resulted as follows: President, Dr. R. P. Huffman, Wilmington, N. C.; First Vice-President, Dr. S. A. Alexander, Monroe, N. C.; Second Vice-President, Dr. J. H. Brown, Rich Square, N. C.; Secretary-Treasurer, Dr. J. P. Spoon, Burlington, N. C.

J. P. SPOON, *Secretary-Treasurer.*

MARYLAND VETERINARY MEDICAL ASSOCIATION

The seventh annual meeting of the Maryland Veterinary Medical Association was held July 19th and 20th, 1923, at Frederick, Md. The meeting was called to order at 10 a. m., July 19th. Dr. R. V. Smith, President, in the chair. Owing to indisposition, the Mayor of the city, Hon. Lloyd C. Culler, was unable to be present and the address of welcome was made by the Secretary.

Following the response, the Association listened to a very able exposition on "Milk Faults," by Professor I. G. Weld, of Washington, D. C., Scientific Investigator for the Chestnut Farms Dairy, of that city. Professor Weld's review of the various reasons why milk had to be rejected at the time of its arrival at a large city milk distributing plant, and the relative frequency of each such reason for rejection, was most interesting and instructive.

Following Professor Weld, Professor G. A. Dick, of the University of Pennsylvania, read a paper on "Vitamins in Cow Feeds." His review of the discovery of these substances, the subsequent work with them and the present-day knowledge of the four vitamins now recognized, was able, thorough and very instructive. Other than in the writings of Dr. McCollum, of Johns Hopkins University, little has yet been written about these most interesting properties and the summary of what is known was, therefore, very timely.

Following an adjournment for luncheon, the Association convened at the Frederick County Fair Grounds for the clinics. These consisted of a double cryptorchid operation, by Dr. R. V. Smith; the removal of a retained testicle in a hog, by Dr. Frank Ryan, of Middletown, Md.; the examination and removal of a portion of a mummified fetus in a cow, by Dr. John P. Turner, of Washington; the setting-up of ears on several Boston Terriers, under ether, by Dr. William P. Collins, of Washington, D. C.; the examination for the parasite, under the microscope, in a case of mange, and the examination for intestinal parasite eggs, under the scope, both under the direction of Dr. Collins, as well as an ovariectomy in a cat, by the same surgeon.

The clinics were over at about six p. m., and all hurried to the Hotel to prepare for what we hope will be an annual banquet at 7 p. m. Forty-eight members and guests gathered for refreshments. The dinner was admirable, the music enjoyable, save

that Dr. Smith was off key, several times, and the speech of the evening short, so the occasion was one to be remembered and repeated.

During our morning session, the ladies of the party visited and shopped, as their fancies dictated, under the guidance and direction of our hostesses, Mrs. Smith, Mrs. McClellan and Mrs. Avery. In the afternoon they made an extended sightseeing trip in autos, provided by the Chamber of Commerce.

The Friday session convened at the Y. M. C. A., at 10 a. m. Letters of regret were read from Professor J. A. Gamble, of the University of Maryland, and Dr. W. E. Cotton, Assistant Superintendent of the U. S. Experiment Station, at Bethesda, both of whom were unable to be present. An able presentation of "Treatment of Retained Placenta," by Dr. John P. Turner, of Washington, D. C., was the first of our program. In addition to his thorough discussion of the subject, Dr. Turner exhibited the clothing and instruments he had found most useful in the cases needing this attention and gave interesting sidelights on his varied experiences. (Dr. Turner's paper is published in this number of the JOURNAL.)

Following a discussion of this paper, we were entertained by Dr. E. M. Pickens, of the University of Maryland, with a lecture illustrated with lantern slides and a movie film on "Parasites of Poultry." Not much discussion was given the subject because of the fact that Dr. Pickens seems to be our only member with any intimate knowledge of it. His statistics of the magnitude of the poultry industry in Maryland were something of a revelation to most of our members.

Dr. Charles Stevens, of the firm of Parke, Davis and Co., then presented his paper and discussion, illustrated with lantern slides, on "Standardization of Drugs." The sources of most of the standard drugs used were revealed and their manner of preparation discussed. A general discussion of the usefulness of the distemper serums and vaccines here intervened.

Dr. M. F. Barnes, of the Pennsylvania State Department of Agriculture, then concluded the morning session with an admirably prepared and thorough presentation of "Sterility." It was unanimously requested that this paper be reproduced for the study of all of our membership. (Dr. Barnes' paper will be published in an early issue of the JOURNAL.)

Following luncheon a clinic was again held at the Fair Grounds. The roaring operation with a burr was performed on an excellent

subject by Dr. Collins, of Washington, assisted by Dr. Smith, and a tumor was removed from the foreleg of a mule, under local anesthesia, by Dr. Smith. Dr. Turner then completed the removal of the mummified fetus upon which he had worked the previous day.

The business meeting of the Association was held immediately after the clinic. Minutes of the January meeting were read and approved and the following members and guests responded to the roll:

Campbell, Conroy, Dornheim, Atherton, Welsh, Grapp, Gross, Grubb, Hastings, Hartenstein, Pickens, Koerner, Meisner, Melody, Muller, McClellan, Martin, Mullineaux, Poe, Reed, Ryan, Rome, Sapp, Smith, Turner, Young, Simonds, Poelma, Mitchell, Collins, Langford, of Martinsburg, W. Va., Fuller and Springer, of Pennsylvania, Dick, of Philadelphia, Barnes, of Harrisburg, Stevens, of Baltimore, Ruebush, of Washington, Edison, Case, Casey, of Virginia, Jones, of Delta, Pa., Braninger, Wright, Hoffman and Cruikshank.

Applications of Drs. Mitchell, of Berryville, Virginia, and Wheeler, of Delta, Pa., were approved. Secretary reported amount on hand as about ninety dollars and was directed to pay outstanding accounts for the meeting. Suggestion was made that the mid-winter meeting be arranged for two days, with clinics. No action was had upon the suggestion. Meeting adjourned at 5 p. m.

The ladies of our party were entertained during the forenoon of Friday, at the residence of Mrs. Smith. As all members departed very promptly after our business meeting, it was quite evident that our better halves had spent the afternoon in packing up and, let us hope, paying hotel bills.

HULBERT YOUNG, *Sec'y.*

NEW YORK STATE VETERINARY MEDICAL SOCIETY

The thirty-third annual meeting of the New York State Veterinary Medical Society was held at Ithaca, July 25, 26, 27, 1923. The meeting was called to order by the President, Dr. W. Reid Blair. Prof. C. L. Durham gave the address of welcome for Cornell University. Prof. Durham is an interesting and popular speaker so far as the veterinarians are concerned. He has spoken before several groups of students and practitioners and his talks are always welcome. Mayor L. P. Smith gave the address on

the part of the city of Ithaca. Dr. D. H. Udall gave the response for the Society. A meeting with such a happy choice of speakers for the opening exercises is bound to be a great success and so this meeting was held to be one of the best in the history of the Society.

Dr. W. Reid Blair contributed largely to the meeting through his rare ability as presiding officer, and by tact and courtesy in guiding the progress of the program and business. His address will appear in an early number of one of the professional journals and is very much worth reading.

During the afternoon session of the first day several very fine papers were read. Dr. R. H. Spaulding took as his topic "Abortion, Septic Metritis, Pyometra, Cystic Ovaries and Sterility in Cats." His experience in the work with small animals fitted him well for such a paper. "Urinary Calculi in Small Animal Practice" was the contribution of Dr. Frank H. Miller. Dr. Miller has very recent, rich, operative experience in that line and his paper and discussion were very instructive.

Dr. A. Eichhorn presented a paper on "The Single Vaccination Treatment for Rabies." The information given by Dr. Eichhorn was valuable and brought forth a good discussion. Dr. Eichhorn contributed discussions to other papers which were read and in that way was a further help to the meeting. A great deal of interest was manifested in the paper by Dr. J. W. Fuller, on "The Diagnosis and Treatment of the Most Important Poultry Diseases in New York State."

Dr. Blair presided at the dinner given at the Hotel Ithaca. The paper by Dr. R. S. MacKellar, on "Veterinary Practice in Greenwich Village Thirty Years Ago," had been scheduled for another time, but due to the absence of one of the evening speakers the paper was read as part of the evening program.

An innovation at this meeting was the reading of a paper by Mrs. J. L. Wilder, at the conclusion of the dinner, on "The Trials and Tribulations of a Veterinarian's Wife." As the wife of a New York State practitioner, she was equal to her subject and the members and guests were agreeably entertained and instructed by the things she had to say.

Assistant Commissioner C. P. Norgord, of the Department of Farms and Markets, gave a talk concerning the relationship of the practitioner to the accredited-herd plan, as being worked in New York. His talk was looked forward to with interest, for he has charge of the administration of the work. He is a very

convincing and interesting speaker. Dr. Frank H. Miller was also called upon for a few words.

Dr. H. J. Metzger has charge of veterinary extension work in this state and he gave an interesting paper, "Our Mutual Interest in Veterinary Extension Work." The next paper of the morning session of the second day was read by Dr. C. M. Carpenter, as joint author with Dr. Geo. H. Hart, of Berkeley, Calif. The subject was "Bacterium Abortum Invasion of the Tissues of Calves from the Ingestion of Infected Milk."

Dean V. A. Moore had prepared a paper, "Diseases Communicable to Man Through Milk," to be read at another period of the meeting. There was a demand to hear this paper on the part of those who could not be in the meeting at any other time and Dr. Blair ruled it in order. Dr. W. L. Williams was next, with "A Study of Reports of Abortion Committees." Dr. Eichhorn, Dr. Traum and Dr. Williams were active in the discussion of this paper.

The last paper of the morning was read by Dr. J. W. Benner. His subject was "Immunizing Young Pigs Against Hog Cholera." "Why Should Stock Owners Not Be Paid for Cattle Reacting to the Tuberculin Test Made by an Approved Veterinarian?" was the contribution of Dr. Chas. S. Chase, to the afternoon program of the second day. This paper and its discussion led to the submission by the Committee on Resolutions, of two or three resolutions touching upon the tuberculosis question. One called upon the Commissioner of Farms and Markets of New York State to appoint a veterinarian as head of the Bureau of Animal Industry. Another signified the willingness of the profession to cooperate with the Farm Bureau in a campaign of education. Another asked the Society to appoint a delegate to attend the meeting of the U. S. Live Stock Sanitary Association, its next meeting in Chicago. All three were ratified without dissent.

Mr. Victor C. Underwood talked on "The Cooperative Purchasing of Horses." The paper read by Dr. W. G. Hollingworth had as its subject "The Veterinarian's Duty to the Public." The final paper of the afternoon was that by Dr. Geo. H. Berns, entitled "Veterinarians and the Status of Veterinary Medicine in New York City and Brooklyn Forty or Fifty Years Ago."

Dr. R. W. Gannett, of Brooklyn, was elected President. Dr. Chas. S. Chase, of Bay Shore, was elected Vice-President. Dr. C. E. Hayden, of Ithaca, was re-elected Secretary-Treasurer and

Dr. H. J. Milks, of Ithaca, Librarian. The Society voted to meet in Ithaca again next year, after a cordial invitation by Dean V. A. Moore.

Dr. H. B. Leonard and assistants conducted post-mortems on tuberculous cattle during the morning of the third day. Men who stayed for the demonstrations expressed themselves as having derived considerable benefit from the work.

C. E. HAYDEN, *Sec'y-Treas* ■

DELAWARE VETERINARY MEDICAL ASSOCIATION

Members of the Delaware Veterinary Medical Association and their wives gathered at the Hotel Belhaven, Rehoboth, August 15, 1923, as the guests of Dr. Frederick P. Ruhl, of Milford. Dr. Ruhl extended his invitation to meet at Rehoboth at the time of the University of Delaware Veterinary Conference in December. A splendid attendance at the Rehoboth meeting indicated the doctor's invitation was thoroughly appreciated.

Dr. and Mrs. Ruhl welcomed the members as they arrived at the noon hour. The hotel management provided a special dinner table for the Association in the main dining room of the hotel. Dr. H. P. Eves, of Wilmington, was given the seat of honor at the dinner table on the occasion, he being the oldest graduate practitioner of veterinary medicine in the state. Following the dinner, which was served in true Southern Delaware style, the ladies were entertained by Mrs. Ruhl, while the members held a short business meeting.

Dr. Louis A. Klein, of the University of Pennsylvania, scheduled to address the members at this meeting, was detained in Philadelphia and, consequently, was unable to make the trip to Rehoboth. Dr. Ruhl, substituting for Dr. Klein, gave a very interesting talk upon "The History of Veterinary Medicine in Delaware," especially as it appertains to lower Delaware. The doctor discussed veterinary medicine in the past, present and future. He seems to hold a very optimistic outlook for the future of the profession. It is perhaps not amiss to state in this connection that Dr. Ruhl has been in practice in Delaware for eighteen years. He has built up a wide and extensive practice in a county that has been heavily infested with non-graduates. He is the only graduate veterinary practitioner in Sussex County, but in spite of his isolation from graduate associates, he has kept

abreast of the times and is held in high esteem by all who know him. Dr. Ruhl was formerly Professor of Veterinary Science at the University of West Virginia. He took an active part at the organization of the West Virginia Veterinary Medical Association and is a charter member of that body. The doctor has always been an active worker in the Delaware Association and is a member of the American Veterinary Medical Association.

The Secretary read the proposed new constitution and by-laws, as recommended by the Executive Committee. The new constitution and by-laws was unanimously adopted. When this Society was reorganized at a conference of the veterinarians held at the University of Delaware, last December, the new Secretary was unable to find a copy of the constitution and by-laws. In fact, all records of the old Association were apparently lost. At the suggestion of the Secretary, a new constitution and by-laws was prepared and submitted to the Executive Committee. The Association is now working upon a well-organized basis, and by holding its annual meeting each year in connection with the annual University Veterinary Conference, a long and vigorous life is fully expected for the Association.

Following the business meeting, the party gathered on the spacious veranda of the Hotel Belhaven, overlooking the Atlantic Ocean and the bathing beauties of Rehoboth Beach. Those too old for sight-seeing made many difficult diagnoses and cured many difficult cases. The more adventurous members and their wives not only looked, but actually partook of the splendid bathing facilities afforded by Rehoboth Beach.

C. C. PALMER, *Secretary*.

SWAMP FEVER CARRIERS

Bulletin 168, from the North Dakota Agricultural Experiment Station, by Drs. A. F. Schalk and L. M. Roderick, gives some very interesting data on the "History of a Swamp Fever Virus Carrier." In this publication it is recorded that a known positive case of swamp fever (equine infectious anemia) may go for fourteen years without showing anemia, and then, without apparent cause, rapidly break down and show all of the usual clinical manifestations of typical field cases, including a profound anemia. The need is stressed for some quick, accurate diagnostic test for detecting infected animals and eliminating carriers. The absence of anemia is not to be taken as failure to reproduce the disease in experimentally infected cases.

COMMUNICATIONS

MAL DE CADERAS

TO THE EDITOR:

May I draw attention to one remark, written in the July issue of the JOURNAL, which comes under a review of Professor G. H. Wooldridge's "Encyclopedia of Veterinary Medicine, Surgery and Obstetrics." The words written in the JOURNAL are as follows: "An inquiry came for information concerning a disease existing in Panama, known locally as "derrengadera" or "murrina." We turned to the book for information concerning the Panama disease, but failed to find any mention of it."

As "derrengadera" is a term used locally, for a disease universally called "mal de caderas," it is quite possible that Professor Wooldridge has good reasons to offer for the omission of such a local term. For an author to quote all local terms used for certain diseases, however wide his knowledge may be, like that of Professor Wooldridge, is almost impossible.

I shall, for example, mention one disease, which is most prevalent at certain months of the year in Europe, called braxy, also known, as *dwfr-coch*, *gwaewr-hydref*, *bradsot*, *clefyd-yr-wyn*, *strike*, *folleth*, *chwaren-goch*, etc. To know all the terms used in different districts for this fatal disease of sheep is almost as impossible as to discover a curative remedy for it, or for "mal de caderas," as, up to now, we have to admit to owners of horses and sheep that pills and potents and even inoculations are of very little value as curatives of these two diseases.

Tartar emetic, injected intravenously, seems to prolong the life of horses suffering from "mal de caderas," but eventually the animals succumb to the effects of the wriggling parasites; satisfactory results have been claimed by experimental injections of Bayer's 205, on small, laboratory animals, but we still await for such results in the case of the horse.

Upon my arrival in Venezuela, nine years ago, I had to admit to horse owners that I was ignorant of this local term "derrengadera," as the one used in all the text-books which I had read was "mal de caderas," which, of course, means almost the same thing. Nevertheless, neither term is correct. "Mal de caderas" signifies disease of the hip or the joint of the thigh. "Derrenga-

dera" is derived from the verb, derrengar, which means, to hip or to sprain the hip. Anyone who has seen the water-hog (capybara) known locally as "Chiguire," limping along the river banks, when suffering from this disease, would admit that they can be pardoned for thinking that the seat of this irregular gait is situated only in or around the hip joint.

Seeing that "mal de caderas" is the original term used in textbooks for the one and the same disease, which is locally called "derrengadera," I think it would be advantageous to retain the original and universal term, until someone can suggest a better one.

Yours faithfully,

EDWARD MORGAN, F.R.C.V.S., D.V.H.

Government Veterinary Inspector.

Puerto Cabello, Venezuela, July 27, 1923.

CURDLED MILK

TO THE EDITOR:

The condensery here (Carnation Milk Co.) has had trouble this summer with sweet milk curdling. Before using milk they run samples for many different tests, one being the alcohol test, which is the only one that interests us at the present. They have found that one of the reasons for alcohol curdling sweet milk is the leucocytic content. They have also found that this milk cannot be separated, because it quickly clogs the separator. So, naturally, this milk is unfit for use in the condensery and creamery.

The dairyman has come to the veterinarian for help. Clinically the cows appear in the best of health, not even a pathological lesion of the udder, nor even any history of a disturbance. The udders are pliable and seemingly normal. The cows affected cannot be identified, except by this alcohol test, which has been done just as they were milked in the dairy. Many herds in this vicinity had this malady a year ago, but it was not so extensive and lasted only a day or two. This season it has become rather serious, in several herds as many as ninety per cent of the herd being affected.

Macroscopically this milk seems perfectly normal. Microscopically no organisms have as yet been isolated, although the bacterial count runs as high as two million, while under the same conditions a cow standing next to the one giving the curdling

milk has a moderate bacterial count of 200,000 or less. But the affected milk runs exceedingly high in leucocytes.

The food question came up, but with nothing gained as far as we could see. These cows were fed green corn and alfalfa, bran, corn chops and oil meal. Green corn was suspected and they stopped feeding it, but with no results. The affected animals were under the same conditions and rations as other herds.

Sanitation and hygiene was questioned. Because of the extremely wet season muddy runways prevailed. They cleaned up with no results. The affected milk still gave a higher bacterial count under same conditions than the normal or milk not affected.

The problem for us to solve seems to be chiefly: To find out what causes the presence of the high leucocyte count, with no organisms present, no systemic disturbance, and no clinical symptoms. The cows are affected at different and all times of the lactation period. What is the next step to take?

CHARLES ROY STRANGE, D. V. M.

Johnstown, Colo., Sept. 5, 1923.

ABILITY RECOGNIZED

The Trustees of the University of Pennsylvania have appointed Dr. Fred Boerner, Jr. (U. P. '12) first assistant to Dr. John A. Kolmer, Professor of Bacteriology and Pathology in the University of Pennsylvania School of Graduate Medicine.

Dr. Boerner has been in charge of the Pennsylvania Bureau of Animal Industry Laboratories at Philadelphia for the past five years. In his new position his work will be teaching bacteriology to men taking graduate work. He will also have charge of the Graduate Medical School's Laboratory for Clinical Pathology and will ultimately be devoting a part of his time to research work.

While Dr. Boerner's friends regret his loss to the veterinary profession, still they believe he has tremendous possibilities in his new work and that his appointment will tend to bring about a closer relation between the two professions in this country.

TEN EX-PRESIDENTS AT MONTREAL

There were ten ex-presidents of the A. V. M. A. at the Montreal meeting: Drs. W. L. Williams, S. Brenton, John R. Mohler, C. J. Marshall, C. E. Cotton, F. Torrance, V. A. Moore, C. A. Cary, D. S. White and A. T. Kinsley.

NECROLOGY

WILLIAM A. STEPHENSON

Dr. William A. Stephenson, State Veterinarian of Utah, died in a hospital in Salt Lake City on August 16, 1923. He was taken to the hospital eight days before. He had not been feeling well for some time, with a high temperature every day, but gamely stuck to his work, until finally compelled to give up.

Physicians were puzzled as to the nature of his illness, but the death certificate gave Malta fever as the cause of his death. It is thought to have been contracted while Dr. Stephenson was investigating an outbreak of this disease in goats, in the southern part of the State last spring.

Dr. Stephenson was born in Holden, Millard County, Utah, Sept. 13, 1889. He attended the public schools at that place, after which he studied one year at Brigham Young University, two years at the Utah Agricultural College, and two years at the Colorado Agricultural College, graduating in 1916.

After graduation he practiced his profession in Millard County, where he was very successful and popular. Dr. Stephenson was appointed State Veterinarian of Utah, in April, 1921, and discharged the duties of that office in a competent and conscientious manner until his untimely death. The funeral was held in Holden, Sunday, August 19th, and was largely attended by State officers and friends from all over the valley.

Dr. Stephenson was a skilled investigator, an indefatigable worker, a good citizen, a loving husband and father, well liked by fellow workers and all who came in contact with him. Had he been spared he would have gone far. He will be missed. He is survived by his widow, three children and several brothers and sisters, to whom we extend our deepest sympathy.

Dr. Stephenson joined the A. V. M. A. in 1921 and was Resident Secretary for Utah, 1922-3. He served one term as President of the Utah Veterinary Medical Association.

MRS. A. T. GILYARD

Mrs. A. T. Gilyard, wife of Dr. A. T. Gilyard, died September 7, 1923, after an illness of over a year. Our sympathy goes out to Dr. Gilyard and the four sons who are left to mourn the loss of their devoted mother.

W. H. WRAY

Dr. W. H. Wray, of Beaconsfield, Bucks, England, died August 24, 1923. He was the representative of the U. S. Bureau of Animal Industry, stationed in Great Britain since August 1, 1890, and was to have been placed on the retired list next January. He was originally appointed as a veterinarian in the Bureau to assist in the eradication of contagious pleuro-pneumonia.

Born in Rathway, N. J., January 7, 1854, Dr. Wray attended public schools in New York City, including Friend's Seminary and business college. He died as a result of a complication of diseases, at his residence, which he patriotically called "Maryland," in Ledborough Lane. He was buried on August 27, in Beaconsfield Cemetery in the presence of many of his friends who came to pay their last respects.

Dr. Wray's jovial manner and his readiness to express his honest opinion soon won for him a place in the confidence of the British officials. He had the happy faculty of remaining a true American during his foreign sojourn, but was always considered by every Britisher, with whom he came in contact, as a true friend and helpful adviser.

Having joined the American Veterinary Medical Association in 1878, Dr. Wray enjoyed the distinction of being one of the four oldest members at the time of his death. He was a graduate of the American Veterinary College, class of 1878. He was Resident Secretary of the A. V. M. A. for the British Isles for several years.

FERD A. MUELLER

Dr. Ferd A. Mueller, a life-long resident of Indianapolis, Ind., died very suddenly, September 13, 1923. Dr. Mueller was a charter member and a graduate of the Indiana Veterinary College, class of 1908, and was an instructor and secretary-treasurer of the institution for thirty years. He was also secretary of the Indianapolis College of Pharmacy and a leading druggist of Indianapolis. Besides being president and treasurer of the Ferd A. Mueller Drug Co., he was identified with a large number of other business interests in Indianapolis. Dr. Mueller was a thirty-second degree Mason and a Shriner.

Dr. Mueller was a man of philanthropic ideals and devoted much of his time to charity. He was a charter member of Allenheim, of Indianapolis, a home for aged men and women, and served as president of the organization from its beginning up to the time of his death. He was also an active director of the General Protestant Orphan Society of Indianapolis for more than thirty years and once served as president.

The deceased was a lover of mankind and ever since the death of his wife, in 1905, he devoted a great part of his time to the service of helping others. He was a man who readily forgave an enemy and was ever ready to sacrifice for the comfort of others.

He is survived by his three children, Albert G. Mueller, Mrs. Margaretta Fertig and Dr. Ferdinand A. Mueller, Jr. The latter was elected secretary-treasurer of the Indiana Veterinary College, May first last, at the request of his father. Three brothers and two sisters also survive him.

Dr. Mueller was among the Hoosiers who attended the recent meeting of the A. V. M. A., in Montreal. He joined the Association in 1908.

J. CURTIS MICHENER

Dr. J. Curtis Michener died at his home in Quakertown, Pa., on Sept. 2, 1923, aged 80 years. He was a son of the late Dr. Isaiah Michener, one of the early practitioners of Pennsylvania who practiced his profession in Bucks County (Pa.) for sixty years.

The deceased was a brother of the late Dr. C. B. Michener, at one time Assistant Chief of the U. S. Bureau of Animal Industry, and the father of Dr. E. Mayhew Michener, one of the most prominent young veterinarians of this country, who died a few years ago.

It was the correspondent's experience to hear a lecture at the School of Veterinary Medicine, University of Pennsylvania, in 1888, when three generations of the Michener family, all veterinarians, were present, Drs. Isaiah, J. Curtis and E. Mayhew.

The Michener family have been veterinarians in eastern Pennsylvania for nearly a century and have all been brilliant men, who have devoted their lives to country practice and have all been eminently successful as cattle practitioners.

It was Dr. J. C. Michener who rather startled the Atlantic City meeting of the American Veterinary Medical Association

in 1901, by leading a cow into the clinical arena and giving a clinical lecture. This was the beginning of such work at our national meetings.

Dr. J. C. Michener was very much interested in agriculture and had spent most of his later years on his farm, near Colmar, Pa. He is survived by a son and daughter.

J. P. T.

IRA B. LUDINGTON

Dr. I. B. Ludington, of Ludington, Mich., according to press dispatch, died August 30, 1923, as a result of injuries received in an automobile accident on August 4. Dr. Ludington was a graduate of the Ontario Veterinary College, class of 1904, and a licensed practitioner of Michigan. He was 37 years of age.

M. J. SISLEY

Dr. M. J. Sisley, deputy State Veterinarian of Idaho, died by his own hand, July 27, 1923, at Buhl, Idaho. Despondency is believed to have prompted the act. Dr. Sisley was born September 6, 1891, received a high school education, and graduated from the Veterinary Division of Michigan Agricultural College, in 1915. For some time Dr. Sisley was a veterinary inspector in the Bureau of Animal Industry. He joined the American Veterinary Medical Association in 1921. He leaves a widow, a bride of less than three months.

ENGAGEMENT

Dr. E. V. Moore (Corn. '17) of Cortland, N. Y., and Miss Lulu M. Williams of Owego, N. Y.

MARRIAGES

Dr. John B. Taylor (U. P. '17) of Brookings, S. Dak., to Miss Louise Mitchell of Philadelphia, August 1, 1923.

Dr. Francis D. Egan (Ont. '23), of Detroit, Mich., to Miss Clementine Owen, of Toronto, Ont., June 2, 1923.

Dr. H. C. Rea (K. C. V. C. '18), of Charlotte, N. C., to Miss Flora McNeil Barnes, at Fayette, N. C., June 28, 1923.

Dr. Leo S. Englerth (K. C. V. C. '18) of Royalton, Minn., to Miss Florence May Orth, at Royalton, August 21, 1923.

BIRTHS

Dr. and Mrs. B. G. Darling, of Hooper, Nebraska, a daughter, August 29, 1923.

Dr. and Mrs. C. L. Wells, of Baldwin, Kan., a daughter, Shirley Jeane, June 22, 1923.

Dr. and Mrs. L. F. Holmes, of Hillsboro, Wis., a daughter, Patricia Louise, August 9, 1923.

Dr. and Mrs. R. Schaap, of Pipestone, Minn., a daughter, Irene Catherine, August 19, 1923.

Dr. and Mrs. Bernard Johnsen, of Spokane, Wash., a son, Dale Bernard, August 22, 1923.

Dr. and Mrs. William A. Hagan, of Ithaca, N. Y., a daughter, Janet Ann, August 26, 1923.

Dr. and Mrs. L. M. Graham, of Rolfe, Iowa, a daughter, Phyllis Jean, September 3, 1923.

PERSONAL

Dr. R. J. Coffeen (Chi. '06), is Mayor of Stillwater, Minn.

Dr. Hubert C. Smith (Iowa '23) has located at Jesup, Iowa.

Dr. O. K. Simonsen, formerly of Nashville, Tenn., is now at Ames, Iowa.

Dr. R. O. Barnes (Chi. '18), of Claxton, Ga., is Assistant State Veterinarian.

Dr. Robert L. Galt (U. P. '23) has engaged in practice at Quarryville, Pa.

Dr. I. W. Horton (Chi. '95) has removed from Gary, Ind., to Middletown, W. Va.

Dr. A. Hyde (A. V. C. '87) has removed from Philadelphia, Pa., to Brooklawn, N. J.

Dr. J. A. McKitterick (K. S. A. C. '22) of Greenwood, Mo., is a breeder of Hereford cattle.

Dr. H. H. Custis (U. P. '07) is assisting Dr. George S. Fuller, of Philadelphia, with his practice.

Major J. R. Shand (Chi. '07) has been transferred from Fort Oglethorpe, Ga., to Fort Sill, Okla.

Dr. Harry Hedin (McK. '18) has removed from Twin Valley, Minn., to Crookston, same state.

Dr. S. A. Watters (K. C. V. C.), formerly of Poteau, Okla., has gone to Broken Arrow, same state.

Dr. H. M. Springer (Ind. '17) is on temporary work in Wyoming, with the Bureau of Animal Industry.

Dr. E. M. DeTray, (Ont. '07), of Napoleon, Ohio, was nominated for Mayor, at the recent primaries.

Dr. L. S. Backus (Corn. '06) and family, of Columbus, Mo., visited Ithaca, N. Y., during the latter part of July.

Dr. A. D. Hubbell (Chi. '06), of San Bernardino, Calif., is Live Stock Inspector for San Bernardino County.

Dr. U. G. Fridirici (Ont. '90) of Tamaqua, Pa., is again able to practice a little, after an illness of seven months.

Dr. William J. Martin (U. P. '18) has been elected Secretary of the Conestoga Veterinary Club, of Pennsylvania.

Dr. W. O. Hughes (Ind. '16) has severed his army connections and is now located for practice at West Point, Miss.

Dr. Dwight H. Bennett (U. P. '15) is located at Substation 14, of the Texas Agricultural Experiment Station, at Sonora.

Dr. T. M. Bayler (Chi. '11) is cooperating veterinarian with the McLean County (Ill.) Farm Bureau, at Bloomington.

Dr. William J. Lentz (U. P. '04) of the University of Pennsylvania, enjoyed a well-earned vacation at Beach Haven, N. J.

Dr. E. J. Tansey (Ind. '08), of Monrovia, Ind., is President of the Indiana State Board of Veterinary Medical Examiners.

Dr. R. J. Schermerhorn (San. Fran. '14) is now located at 15 N. Chapel St., Elgin, Ill., He was formerly at Redlands, Calif.

Dr. S. O. Fladness (Chi. '12) has been transferred from North Portland, Oregon, to Baton Rouge, La., 603 Roumaine Bldg.

Dr. George W. Winslow (Ind. '20) is now located at Bend, Oregon, P. O. Box 725. He was formerly at Ontario, same state.

Dr. J. A. Bogue (K. S. A. C. '21) of Lawrence, Kans., in remitting his dues, writes: "I could not get along without the JOURNAL."

Dr. E. V. Moore (Corn. '17), of the firm of McAuliffe and Moore, at Cortland, N. Y., acts in the capacity of County Veterinarian.

Dr. Hansford H. Rowe (Chi. '18) has been appointed chief of the meat inspection service recently inaugurated in Richmond, Va.

Dr. John E. Gregory (Ont.) has purchased Lake Mineola, in the Pocono Mountains, and is developing it into a fine summer resort.

Dr. E. A. Williams (St. Jos. '19) is now associated with Dr. John Schreiber, Director of the Ouachita Parish Health Unit, at Monroe, La.

Dr. J. R. Aufente (U. S. C. V. S. '06) has removed from Union City, Tenn., and is now with the C. H. Abattoirs Corporation, Altoona, Pa.

Dr. Charles H. Kitselman (U. P. '18) has been commissioned as First Lieutenant in the Veterinary Officers' Reserve Corps, U. S. Army.

Dr. Harry Shepard (S. W. V. C. '16) is back on the job, at Killeen, Texas, after a lay-off since last May, due to an attack of trifacial neuralgia.

Dr. Frank Hare (K. S. A. C. '20) has resigned his position as Chief of the Bureau of Animal Industry of Santo Domingo, Dominican Republic.

Dr. H. E. Johnson (Corn. '14), of East Lansing, Mich., with his family visited Ithaca, N. Y., enroute to the A. V. M. A. meeting in Montreal.

Dr. C. D. Carpenter (Corn. '20) resigned his connection with the University of California, July first, to engage in poultry practice at Petaluma, Calif.

Lt. J. F. Crosby (Corn. '15) has been assigned to the Medical Field Service School, Carlisle Barracks, Pa. He was formerly at Fort Ringgold, Texas.

Dr. Earle L. Kittrell (K. C. V. C. '17) of Augusta, Ark., was prevented from attending the Montreal meeting by an outbreak of anthrax in his territory.

Dr. F. J. Bolender (U. S. C. V. S. '14) is Field Veterinarian for the State Department of Agriculture of California, with headquarters at Selma, Calif.

Dr. Harry M. Martin (U. P. '16), of the University of Nebraska, motored to Philadelphia, with his family, and spent his vacation in the Quaker City.

Dr. B. M. Underhill (U. P. '95), of Media, Pa., recently addressed the Delaware County Institute of Science on the subject of "The Japanese Beetle."

Lt. E. M. Curley (U. P. '11) has been transferred from Fort Des Moines, Iowa, to the New York State Veterinary College, Cornell University, Ithaca, N. Y.

Dr. C. W. Borland, of 1430 Franklin Avenue, Columbus, Ohio, according to a local paper, was recently arrested for the second time, on a charge of practicing illegally.

Dr. Jacob Traum (Corn. '05) has returned to the University of California, after a year spent in post-graduate study at Cornell University, with Dr. V. A. Moore.

Dr. John Ramsey (Terre Haute '14) is on meat inspection work at Fort Worth, Texas. He was transferred from tick eradication work, in Texarkana, several months ago.

Dr. H. J. Milks (Corn. '04), of Ithaca, N. Y., accompanied by his family, enjoyed a ten-day camping trip in the Adirondack Mountains during the latter part of August.

Dr. George E. Hunt (Corn. '18) and family, of Champaign, Ill., were recent visitors in Ithaca, N. Y. Mrs. Hunt is a Cornell alumna, class of 1912, and a former resident of Ithaca.

Dr. Wm. F. Egan (M. R. C. V. S.), of San Francisco, recently wrote: "Inclosed please find check for \$16.50, being dues for my two sons and myself, and also for three lapel emblems."

Dr. Miller F. Barnes (U. P. '11) has been appointed Director of the Laboratories of the Pennsylvania Bureau of Animal Industry, Philadelphia, Pa., succeeding Dr. Fred Boerner, Jr.

Dr. A. J. Webb, who has been acting as Assistant State Veterinarian of Utah, has been appointed to the position of State Veterinarian, following the death of Dr. Wm. A. Stephenson.

Dr. George H. Hart (U. P. '03) of the University of California, is spending some time in the East. He attended the Montreal meeting and plans to take in the International Dairy Congress.

Dr. Mason Weadon, of Fort Pierce, Florida, is City Food Inspector and, in addition to his private practice, looks after a good-sized farm. Dr. Weadon puts out a hundred acres of tomatoes every year.

Dr. O. F. Hoekzema (Gr. Rap. '10) of McBain, Mich., met with a serious accident on July 3rd, which prevented him from attending the Montreal meeting. At last reports he was recovering slowly.

Dr. I. D. Wilson (Iowa '14) has left Pennsylvania State College, to accept the position of Professor of Veterinary Science, at the Virginia Polytechnic Institute, Blacksburg, Va., succeeding Dr. Wm. G. Chrisman (Ont. '02).

Dr. C. E. Sawyer (K. S. A. C. '21) Assistant Professor of Pathology, K. S. A. C., in remitting his dues, writes: "I am anxious not to miss a number of the JOURNAL, because it contains such interesting and beneficial articles."

Dr. Louis J. Helfand (U. P. '20) encamped with the Fifty-sixth Infantry Brigade, at Mount Gretna, Pa., during July. He holds the rank of First Lieutenant in the Veterinary Corps and is attached to Brigade Headquarters.

Dr. John H. Winstanley (U. P. '10) is representing the Pennsylvania Bureau of Animal Industry, at the county fairs in the Keystone State, with an exhibit of pathological specimens of contagious and infectious diseases of domesticated animals.

Major J. Payne Lowe (N. Y. U. '91 and Nat. V. C. '93), of Passaic, N. J., Professor Wm. Herbert Lowe (N. Y. U. '88), of Paterson, N. J., and Hon. L. Whitney Watkins, Lansing, Mich., Secretary of Agriculture of the State of Michigan, are first cousins.

Dr. J. B. Latshaw (Corn. '16), of Caruthersville, Mo., formerly a member of the teaching staff at Cornell University, paid his Alma Mater visits, both going to and returning from the A. V. M. A. meeting in Montreal. Dr. Latshaw was accompanied by his family.

Dr. L. G. Hart, Sr., (Ont. '92) of Chippewa Falls, Wis., recently met with a serious accident. He received very extensive burns, the result of the gas tank in his car catching fire while it was being filled. It is expected that he will be confined to the hospital for quite some time.

Dr. Russell S. Detwiler (U. P. '15) of Reading, Pa., was in camp at Mount Gretna, Pa., with the Twenty-eighth Division, National Guard of Pennsylvania, during the latter part of July. He is a First Lieutenant in the Veterinary Corps and is attached to an artillery regiment.

Dr. B. Scott Fritz (U. P. '17), of the Pennsylvania Bureau of Animal Industry took his vacation in Maine and Quebec. He states that he caught a fish at Bar Harbor, several feet long. His colleagues do not doubt that he caught a fish, but think it was one of the elastic variety.

Dr. J. R. Fuller (K. S. A. C. '12), of Walla Walla, Wash., reports a recent outbreak of anthrax in a dairy herd resulting in the loss of eight pure-bred Jersey cows. The correctness of the diagnosis was confirmed by cultural methods as well as by animal inoculation. This is the first outbreak reported in the State of Washington and is believed to have been introduced through the medium of feedstuffs.

Dr. Guy W. Rosenberger (San. Fran. '06) has resigned his position as Chief of the Bureau of Tuberculosis Control, Division of Animal Industry, of the California Department of Agriculture, and has been reinstated in the U. S. Bureau of Animal Industry, and assigned to tick eradication work as traveling supervising inspector, on the force of Dr. H. Grafke, of Fort Worth, Texas. Dr. Rosenberger's official station is San Antonio, Texas.

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 735 Book Building, Detroit, Mich.

C. H. STANGE, President, Ames, Iowa.

M. JACOB, Treasurer, Knoxville, Tenn.

Executive Board

GEO. HILTON, 1st District; T. E. MUNCE, 2nd District; D. S. WHITE, 3rd District
J. A. KIERNAN, 4th District; C. E. COTTON, 5th District; B. W. CONRAD,
6th District; CASSIUS WAY, Member at Large, CHAIRMAN.

Subcommittee on Journal

D. S. WHITE

J. A. KIERNAN

The American Veterinary Medical Association is not responsible for views or statements published in the JOURNAL, outside of its own authorized actions.

Reprints should be ordered in advance. Prices will be sent upon application.

Vol. LXIV, N. S. Vol. 17

November, 1923

No. 2

PATRONIZE OUR ADVERTISERS

We wish to take this occasion to say a word in behalf of our advertisers. They are indeed worthy of your support. When you are in the market for supplies, drugs, biologics, instruments, syringes or books, turn to our advertising pages and place your orders with the firms whose advertisements you find there. We do not make any bones about it, but freely acknowledge that if it were not for the support of our advertisers it would not be possible to give you the JOURNAL as you now get it, 160 pages or more every month, printed on good paper, in readable type, well illustrated, in fact everything that goes to make up a presentable, dignified, scientific publication. We believe that it is the best journal of its kind in the world today, judged by the quality of its contents as well as its make-up. We would like to have our advertisers believe that our JOURNAL is the most valuable advertising medium they can use. This rests entirely with you, the veterinarians who buy the things these firms have to sell. When you write to make an inquiry or place an order with one of our advertisers, just mention that you saw their advertisement in the Journal. It will help. We are trying to do our part. Will you do yours?

SOCIAL FEATURES AT MONTREAL

The portion of the Montreal program taken up with the social features of the meeting was unusually great, so much so that there were frequent expressions of opinion to the effect that we are over-crowding our programs with social diversions, at the expense of business and scientific sessions. Another thought, along the same line, and given expression by quite a number, is that our meetings are too long. Practitioners especially can ill afford to leave their practices for five days, plus the time consumed in travelling to and from the meeting. This is something that demands serious consideration.

The morning of the first day (Monday) was taken up with the customary opening exercises, with practically no business transacted. The minutes of the session were published in the October issue, together with the presidential address. Monday evening was given over to the President's reception, a very enjoyable affair. President and Mrs. Welch were assisted in the receiving line by Sir Arnold and Lady Theiler, Dr. and Mrs. M. C. Baker, of Montreal, Dr. and Mrs. L. Frood, of London, England, and Secretary and Mrs. Hoskins. After the hand-shaking was over Mrs. Welch and a corps of able assistants kept the wall-flowers from getting rooted in any one spot by keeping everybody on the move. Delightful music enabled many to synchronize their movements until well on towards midnight.

Tuesday morning was devoted to sectional meetings and the afternoon to very serious business, including the election of officers. The evening was given over to meetings of the various alumni associations. Those holding such meetings were the alumni of the Ontario Veterinary College, McGill University and Montreal Veterinary College, American Veterinary College, Ohio State University, Cornell University and University of Pennsylvania. An account of these meetings will be published elsewhere. It can truthfully be said that there are no more enjoyable features of our meetings than these college get-togethers. They constitute a fixture of our meetings.

This year the alumni meetings convened early and were of shorter duration than usual, to enable the members to attend the illustrated lecture by Sir Arnold Theiler on veterinary conditions in South Africa. This proved to be one of the most

interesting presentations ever heard by those whose privilege it was to be present.

Wednesday was devoted to sectional meetings, including the clinic. The evening and a fair part of Thursday morning were given over to the banquet, the first we have had since the meeting in Columbus, in 1920. To those of us who have grown accustomed to the stereotyped procedure of similar festivities in the States, it was somewhat difficult to grasp the scheme of the Montreal method. Once started, however, the affair gathered such momentum that along about midnight many began to wonder whether Toastmaster White would be able to bring the thing to a stop without serious casualties. Just about the time that one member got upon his feet to move that the balance of the speeches be read by title and published in the JOURNAL, the Editor, sensing the situation, demonstrated that he possessed wonderful terminal facilities by bringing the speech-making to an abrupt close.

To those who may wonder what the banquet was all about, and why it was necessary to consume parts of two days with it, kindly be advised that there were about a dozen persons scheduled to respond to toasts, that each toast had to be announced by the toastmaster, who introduced someone to propose each toast. After the toast had been proposed in proper fashion, one or more individuals were called upon to respond to each toast proposed. Furthermore, it was not sufficient to deliver these toasts in one language, but many were given in two, French and English, and, according to Toastmaster White, both languages were frequently spoken at the same time. The reader is left to place his own interpretation upon this phenomenon. The only other point that we will mention here is that President Welch moved Columbus from Ohio over the line into Indiana during the course of the evening.

Thursday morning a general session was held, and at 1:00 o'clock we entrained for MacDonald College. Here we had a splendid opportunity to stretch our legs perambulating over the spacious campus and rambling through the seemingly endless assortment of buildings and barns, the latter quite conspicuous on account of their vacuity at the time of our visit. Thence we wended our devious way down to the wharf to await the boat that was to take us back to Montreal. Ma Baker, in true motherly fashion, saw to it that none dropped by the wayside, incidentally enjoying several ice cream cones en route. As we

paraded down the main street of Sainte Anne one of the villagers remarked that our party was the largest ever seen in the town.

The ride down the St. Lawrence River, back to Montreal, afforded many their first opportunity to take a real rest. The boat was crowded and there was not much room to move around, so the majority remained seated—until we reached the Lachine Rapids. For those who had never made the trip before, the ride through the rapids proved to be a very thrilling experience, and they breathed many a sigh of relief when the rapids were behind them. It is reported that during the afternoon the Blue Owls held a very successful meeting, presided over (of course) by Grand Chancellor Blattenburg. It is further reported that a French section was added to the Order.

Thursday evening the aquatic features were continued in the form of a moonlight boat-ride on the river. This was much enjoyed by those who stuck to the ship, but quite a few were so fatigued by the day's outing that they were only too glad of an opportunity to get back to the hotel and go to bed early.

Friday's program provided for sectional meetings in the morning and the wind-up of the business sessions in the afternoon. By the time that President Welch was ready to turn the affairs of the Association over to his successor, Dr Stange, the audience had dwindled down to a scant score. And thus ended one of the most enjoyable meetings ever held.

OUR NEW PRESIDENT

Dr. Charles H. Stange comes quite naturally to the presidency of the American Veterinary Medical Association. He has been a member of the Association since his graduation in 1907 and has always taken a very active interest in the administration of its affairs.

He was born in Cedar County, Iowa, May 21, 1880, was raised as a farm boy of that period and attended the public school of his community. He entered the Veterinary Division of Iowa State College, Ames, Iowa, in 1903 and graduated with first honors in the entire college in 1907. Later he pursued post-graduate work in pathology at the University of Chicago.

His first work was with the Bureau of Animal Industry in connection with scabies eradication in New Mexico. He was soon brought back to Ames, however, to start his teaching career in which he has been engaged continuously since that



CHARLES H. STANGE

President of the American Veterinary Medical Association

1923—1924

time. As a teacher he gained an unusual reputation for clear thinking, careful analysis and ready presentation. He was known as a man who knew his subject, a man of strong convictions and one who possessed a readiness to stand by them. The high quality of his work and the promise for the future were quickly recognized by the College authorities and in 1909 he was made Dean of the Veterinary Division to succeed Dr. J. H. McNeil who had resigned to accept a position at Ohio State University.

Under the leadership of Dean Stange the Division was soon organized into five departments for teaching and research along their respective lines and one department for research solely. Each department has its head and corps of assistants and each teaches only closely related subjects.

The second big task following organization was to secure funds for and plan and build a complete new group of buildings for the work of the Division. The group is unique in its arrangement and has proved to be most satisfactory.

Soon after the completion of this second task, Dean Stange was required by the State Legislature to build a plant for the production and distribution of anti-hog cholera serum and virus and to draw up rules and regulations for the manufacture, sale and distribution of these products throughout the state. The success and efficiency of this organization is well indicated by the effect which the organization had in controlling hog cholera within the State since 1913.

Dr. Stange has won international recognition as a scholar, a teacher, an organizer and a research worker. He is a member of Sigma Xi and Phi Kappa Phi, honorary fraternities, is a prominent member of the Shrine, of the Acacia fraternity and the Rotary Club of Ames. He was a member of the Executive Board of the A. V. M. A. for four years, is a member of the United States Live Stock Sanitary Association and chairman of its committee on hog cholera control. He is also chairman of the Association of State and National Research Workers in Animal Diseases. This Association is composed of two men from each State Experiment Station and two from each division of the Bureau of Animal Industry doing research work in animal diseases.

Dr. Stange has been an active member of the A. V. M. A. since 1907, and besides his four years of service on the Executive Board, he has given much of his time and energy in serving on

several of the important standing committees of the Association. He has always been an advocate of higher educational requirements, of better research work, of better organization for disease control and for better cooperation with the live stock interests. His strong personality, his keen foresight, and his wide acquaintance with veterinarians and with live stock interests, newspaper men and men in control of State and National affairs make him well fitted to pilot the A. V. M. A. through a successful year.

STUDENT ENROLLMENT FOR 1923-4

Figures so far available indicate a slight falling off in the number of students enrolled in veterinary colleges this year. Only four institutions show an increase over last year's figures: Iowa, Texas, Pennsylvania and Washington. Cornell just held her own. The others show fewer students enrolled this year than last.

In the twelve colleges furnishing information, there are 591 students enrolled. It is interesting to observe how evenly these are distributed throughout the four classes. There are 149 freshmen, 152 sophomores, 132 juniors and 153 seniors. Five special students are included in the total. This evening-up of the classes might tend to indicate that our veterinary student population had reached its own level, in answer to the laws of supply and demand. It would appear from our observations, however, that there is a prospective shortage of veterinarians in the not-far-distant future, at the present rate of going.

The following table shows the distribution of students by classes in the various institutions.

	Fresh.	Soph.	Jun.	Sen.	Spec.	Total	1922-3	Change
Alabama P. I.	..	..	..	..	..	..	..	..
Colorado Ag. Coll.	7	15	12	12	2	48	64	-16
Cornell Univ.	29	25	10	19	.	83	83	0
Georgia St. Coll.	2	8	3	9	.	22	25	-3
Indiana Vet. Coll.	0	11	7	10	.	28	62	-34
Iowa State Coll.	32	24	18	16	.	90	80	+10
Kansas St. Ag. Coll.	12	11	13	18	.	54	65	-11
Michigan Ag. Coll.	5	10	11	9	1	36	39	-3
Montreal, Univ. de	..	..	..	..	..	..	..	..
Ohio State Univ.	13	12	24	20	.	69	79	-10
Ontario Vet. Coll.	16	14	15	27	.	72	82	-10
Penn., Univ. of	14	10	10	5	2	41	38	+3
Texas A. & M. Coll.	11	4	5	2	.	22	13	+9
Washington St. Coll.	8	8	4	6	.	26	19	+7
	149	152	132	153	5	591	649	-58

The following table gives some comparative figures on the past five years, to show how student registration has been falling off.

	Students
1919-20 (does not include Indiana or Montreal).....	800
1920-21 (does not include Indiana or Montreal).....	708
1921-22 (does not include Indiana or Montreal).....	641
1922-23 (does not include Alabama or Montreal).....	649
1923-24 (does not include Alabama or Montreal).....	591

MORE NEW NAMES

In the February JOURNAL appeared an editorial entitled "New Names for Old Friends." This dealt with the revised nomenclature for bacteria, based upon the final report of the Committee of the Society of American Bacteriologists on Characterization and Classification of Bacterial Types. Recently there has been published a book, "Bergey's Manual of Determinative Bacteriology," in which the new classification is used, with the new names given various organisms.

Just when we were getting fairly familiar with some of these new cognomens we find ourselves obliged to start all over again, if we are to adopt the very latest appellations given some of our old friends. For instance, we have been struggling to decide what to call the Bang organism, *Bacillus abortus*, *Bacterium abortus*, *Bacterium abortum* or even *Brucella aborta*, when we note that this much-discussed organism now operates under the name *Alcaligenes abortus* and keeps company with *Alcaligenes bronchisepticus*, of canine distemper fame, and *Alcaligenes melitensis*, the Malta fever organism, erstwhile *Micrococcus melitensis*, and for a short time relegated to the newer genus *Brucella*, now apparently defunct.

Our old friend the hog cholera bacillus, so long known as *Bacillus suispestifer* is now *Salmonella suispestifer* and in this very important group we now find all of the colon-typhoid intermediates, with such important representatives as the paratyphoids, *Salmonella enteritidis*, *Salmonella typhi-murium* and others. It is pleasing to record this recognition of the pioneer work of Dr. D. E. Salmon, the first chief of our federal Bureau of Animal Industry, in connection with these organisms.

Some of the organisms causing disease in the human now go under new names. The diphtheria bacillus is now addressed with great dignity as *Corynebacterium diphtheriae*, while the cause

of typhoid fever is now *Eberthella typhi*. The loathsome gonococcus now passes as *Neisseria gonorrhea*, while tetanus is now caused by *Clostridium tetani*. And thus are our troubles multiplied.

FINE PROGRAM FOR SOUTHEASTERN

Secretary Handley has secured a number of very prominent veterinarians to contribute to the program of the Greensboro, N. C., meeting of the Southeastern States Veterinary Medical Association, on November 12-13, 1923. Among these may be mentioned: Dr. C. H. Stange, President of the American Veterinary Medical Association; Dr. John R. Mohler, Chief of the Bureau of Animal Industry; Dr. Cassius Way, Chairman of the Executive Board of the A. V. M. A.; Dr. T. E. Munce, State Veterinarian of Pennsylvania; Dr. W. J. Lentz, Director of the Small Animal Clinic, University of Pennsylvania; Dr. C. A. Cary, State Veterinarian of Alabama; Dr. W. K. Lewis, State Veterinarian of South Carolina and Dr. Wm. M. Moore, State Veterinarian of North Carolina. Prominent practitioners on the program include Drs. J. T. Dixon, of Rock Hill, S. C., F. W. Morgan, of Chattanooga, Tenn., J. G. Phelps, of Montgomery, Ala., F. E. Kitchen, of Greenville, S. C., W. D. Staples, of Anniston, Ala., and R. H. Parker, of Gastonia, N. C. Dr. M. Jacob, Treasurer of the A. V. M. A., is President of the Southeastern Association this year.

COMING VETERINARY MEETINGS

San Joaquin Valley Veterinary Medical Association, Visalia, Calif., Hotel Johnson, Nov. 7, 1923. H. B. Wintingham, Secretary, 1212 Belmont Ave., Fresno, Calif.

New York City, Veterinary Medical Association of. Academy of Medicine, 17 West 43rd St., New York, N. Y. Nov. 7, 1923. Dr. C. G. Rohrer, Secretary, 40 West 61st St., New York, N. Y.

Massachusetts Veterinary Association. American House, Boston, Mass. Nov. 28, 1923. Dr. C. H. Playdon, Secretary, Reading, Mass.

U. S. Live Stock Sanitary Association. Hotel La Salle, Chicago, Ill. Dec. 4-5-6, 1923. Dr. O. E. Dyson, Secretary, 923 Exchange Bldg., Kansas City, Mo.

Nebraska State Veterinary Medical Association. Grand Island, Nebr. Dec. 11-12, 1923. Dr. F. R. Woodring, Secretary, Lincoln, Nebr.

ON THE SERUM THERAPY OF GLANDERS WITH SPECIAL REFERENCE TO GLANDERS IN MAN¹

By E. A. WATSON,

*Chief Animal Pathologist, Health of Animals Branch
Department of Agriculture, Ottawa, Canada.*

In a study of the antigenic values and immunizing properties of mallein, by complement-fixation test methods, Watson and Heath,¹ have shown that the horse can without difficulty be hyperimmunized with mallein and that an animal so treated can furnish a serum which, in the complement-fixation test, permits of the titration of any sample of mallein and, thereby, gives indication of the widely varying reactivity and antigenic values of malleins of different origin and preparation.

In December, 1922, in discussing with Dr. Gordon Bell, of Winnipeg, a chronic case of glanders in man which was making unfavorable progress in spite of surgical treatment and local applications, I made the suggestion that the administration of the above mentioned anti-mallein serum might be beneficial and that a trial treatment be given. This was readily consented to and was carried out. Meanwhile another case of human glanders developed and the serum was again employed. The results appeared so satisfactory in each case that Dr. Bell, who has had a considerable experience with glanders in man, published a preliminary note on the subject, "The Serum Treatment of Glanders," Jan. 31, 1923.² Subsequently, and in the same locality, a third case of human glanders was diagnosed and came under serum treatment, and similar satisfactory results ensued. The response to serum treatment, as manifested by the almost immediate arrest of the disease and in the rapid healing of the glanderous lesions in each of these three cases was, according to the physicians, 'amazing and of dramatic suddenness.' All the facts and information that I have been able to collect in this connection together with a précis of the animal experiments and laboratory work, I am presenting in this paper in the interests of the medical and veterinary professions.

Acknowledgments. To Dr. Gordon Bell, of Winnipeg, Provincial Government Bacteriologist and Professor of Bacteriology

¹Presented before the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

and Hygiene, University of Manitoba; to Dr. A. Gibson, of the Galloway-Gibson Clinic, Winnipeg; and to Dr. F. W. Jackson, Wawanesa, Manitoba, for their case reports and notes and permission to include them in this paper.

In the animal experiments, preparation of sera and complement-fixation tests, I have had the active co-operation and assistance of Dr. L. M. Heath, Pathologist, Research Station, Hull, P. Q.

THE OUTBREAK OF GLANDERS IN HORSES, TO WHICH THE HUMAN INFECTION IS TRACEABLE

In May, 1922, a veterinarian reported the occurrence of glanders in the vicinity of Treesbank, Manitoba. Immediate investigation and the application of the mallein test to all suspects revealed eighty-five reactors, including eight horses presenting clinical evidence of the disease. Thirty-three premises were involved in the outbreak. One of the affected animals was a light driving mare, which had been shipped from a neighboring province into Manitoba, towards the end of the year 1919 and was subsequently sold and resold a number of times. This mare was used by all her different owners and their families for driving purposes and in going to dances, entertainments, etc. For a long period, over a year, she had been affected with an intermittent nasal discharge; she is rightly considered as the source of infection in this outbreak and the chief spreader of it.

HUMAN GLANDERS

Case No. 1. (Drs. Gibson, Jackson and Gordon Bell). J. T. C., age 26, farmer. Discharging sinuses, right leg, since January, 1922. Admitted to the Galloway-Gibson Clinic, August 18th, 1922, when examination showed five or six discharging sinuses over the surface of the right leg. Several of these were at the upper end of the tibia, several in the neighborhood of the ankle. Examination under anesthesia showed it was possible to pass a probe from the upper right down through the substance of the muscles in front of the leg to the lower sinuses. The condition of glanders was not suspected until patient accidentally mentioned that a number of horses on his farm had been shot for glanders (thirteen of his horses had reacted to the mallein test and three of these, including the driving mare aforementioned, presented clinical evidence of glanders). *B. mallei* was isolated from the pus taken from the patient's leg. General surgical treatment

with iodine and boric fomentations produced slight improvement in condition.

Serum treatment was commenced on December 27, 1922, on which date there were seven discharging sinuses in the region of the right ankle on the anterior and external surfaces. There was a large ulcer, three-quarters of an inch square, just above the internal malleolus. There was another sinus on the anterior surface of the leg at the junction of the upper and middle third. A probe could be passed from this sinus down through the tissues to the ankle. There was a great deal of discharge, some swelling and complete loss of function in the ankle. The condition had been about the same for four months and was so grave that amputation above the knee was seriously considered.

On December 27, 1.5 cc of anti-mallein serum was given; on Dec. 28, 3 cc; on Dec. 29, 3 cc; on Dec. 30, 3 cc. By this time one could note a marked improvement in the leg, the discharge being a great deal less. Owing to a general state of collapse on the part of the patient, serum was discontinued until January 2, when 3 cc was given. On January 6 and on every second day until January 28, 3 cc of serum was given, when treatment was stopped. All discharge had ceased and all sinuses had completely healed. The ulcer on the inside of the foot did not completely heal for about five weeks.

Thus: A condition of chronic glanders had existed for one year. The lesions were extensive; surgical and general treatment had had apparently no appreciable effect. Under serum treatment the lesions healed and the patient was apparently cured in one month. During the early period of serum treatment the patient suffered periodical rises in temperature, nausea and vomiting, and pain in the forehead (a tender spot could be located above and behind the left eye). At the end of the treatment the patient had regained complete use of his leg and was able to go about his work as usual.

About two months later an abscess developed in the frontal sinus of the head. Glanders infection was suspected. Laboratory examinations showed staphylococci, but were negative for *B. mallei*. More serum was given and the area healed. On April 21, patient was acutely ill again, temperature 103° F.; pulse 110, headache, and pain in the left elbow. The general symptoms subsided gradually, but elbow remained swollen, painful and immobilized. Towards the end of June patient was sent into the Galloway-Gibson clinic, where elbow was aspirated. *B. mallei*

was again found in the specimens examined. The elbow broke down into discharging sinuses on July 15.

It is to be regretted, says Dr. Jackson, that there was not a sufficient supply of serum on hand at any one time to give the patient a more thorough and intensive course of treatment.

Case No. 2. F. W. Jackson, age 34, the doctor in attendance on case No. 1. He had a scratch on the right forefinger. He came into his patient's house one day with his gloves very wet and turned them inside out and put them on the radiator. A few days later a sore developed on the injured finger, and in the discharge of pus Dr. Gordon Bell obtained *B. mallei* in pure condition.

Dr. Jackson describes his own case as follows:—

Index finger of right hand became infected January 4, 1923. Glanders suspected. Positive report from swab received January 10. Serum started January 10, initial dose 2 cc; 4 cc given Jan. 11, 13, 15, and 17; 3 cc given every third day thereafter for four doses, then discontinued.

At the start of the treatment the whole dorsal surface of the proximal phalanx of the index finger was involved. This had enlarged from an ulcer one-quarter inch square to one nearly three-quarters by one and one-half inches, with a great deal of discharge, in spite of local treatment. After two doses of the serum all discharge had practically ceased. Three days after the starting of the serum-treatment no culture of the *Bacillus mallei* could be procured from the ulcer. Inside of two weeks after the start of serum-treatment the ulcer was healed and up to the present date there has been no recurrence, August 7, 1923.

Case No. 3. (Dr. F. W. Jackson) A. L., age 13, female.

Was taken acutely ill April 27, 1923, with a chill and headache; vomiting followed, temperature 104° F. Seen forty-eight hours after onset of illness. Complained of headache, cough, pain in right ankle joint. Examination revealed slight bronchitis, immobility of right ankle, pain on movement, no swelling. Swelling developed one day later and fluctuation just below and in front of external malleolus. Opened next day and probed. Sent to Brandon for X-ray on May 3, osteo-myelitis suspected. X-ray showed bones normal. On May 4 general anesthetic was given and foot opened up. Glanders immediately suspected on account of the great destruction of tissue. All the skin on the dorsal and external surfaces of the foot was practically one large

slough. All tendons were bare; five large openings were made and tubes inserted. Examination of potato culture by Dr. Pierce reported on as suspicious. Anti-mallein serum was given as follows: 1 cc twice daily for two days then $1\frac{1}{2}$ cc twice daily for four days, when our supply of serum became exhausted. Three days after start of treatment temperature became normal and at this time another swab was sent to Dr. Gordon Bell. (Report negative.)

Four days after start of treatment discharge had practically ceased and foot began to heal nicely. June 7, all ulcers have completely healed and movement is nearly normal in toes and rapidly coming to normal in the ankle joint. August 8, movement in joint normal no ulceration no discharge; apparently complete recovery.

Note:—Although glanders infection was not proved in this case by isolation of *B. mallei* (the pus was not sent for bacteriological examination until after six injections of serum had been given), no doubt was entertained, clinically, of the nature of the disease which Dr. Jackson regards as acute glanders, probably respiratory in origin.

Bacteriological examinations:—Dr. Gordon Bell examined specimens of pus taken from each case and states: "In cases Nos. 1 and 2 the *Bacillus mallei* was isolated and grew on potato in characteristic fashion and was confirmed by Strauss' reaction on guinea pigs. In case No. 3 I did not examine the pus until some time after serum had been used and failed to find the bacillus, but Dr. Pierce, of Brandon, a very competent man, is sure that the case was one of glanders."

Complement fixation test of human sera for glanders:—On July 15, 1923. Dr. Jackson forwarded to me blood samples from cases Nos. 1, 2 and 3. A complement-fixation test was made, two antigens, (A) a suspension of *B. mallei* and (B) a solution of mallein being employed.

With the suspected sera there were included sera from two of the laboratory workers as negative controls, the serum of a known glandered horse and the serum of a horse immunized to mallein and to killed cultures of *B. mallei* as positive controls.

Human serum, case No. 1, gave strong fixation reactions with both antigens, the serum titre being 0.02 (1.0 cc of 1.50 dilution) with antigen A, 0.1 (1.0 cc of 1.10 dilution) with antigen B. All other human sera were negative. It should be noted that at the time the serum was taken a relapse was occurring in case

No. 1, while cases Nos. 2 and 3 appeared to have made a complete recovery. As already stated, the serum used for the treatment of the three cases of human glanders was obtained from a horse immunized against mallein.

ANIMAL EXPERIMENTS

The accompanying table gives the details of immunization and the titer of the animal's serum, as indicated by complement-fixation reactions, the titer being the minimal amount of serum which completely fixes one unit of guinea-pig complement in the presence of an excess of antigen (mallein). The rabbit-antisheep hemolytic system was employed throughout.

It is, of course, well known, in connection with the serum diagnosis of glanders, that a previous mallein test, or a subcutaneous injection of mallein into a normal horse, may give rise to antibodies and cause positive serum reactions in complement-fixation and agglutination tests for a certain period of time. According to Brocq-Rousseu, Forgeot and Urbain,³ the antibodies disappear and the serum returns to normal in forty-five days after an injection of mallein. Mohler and Eichhorn,⁴ in immunization tests with glanders vaccine, state that "demonstration of the presence of immune bodies in the vaccinated horses ceased entirely in two or three months from the last vaccination. . . . that one or two subcutaneous injections of mallein will give a complement fixation which may last from one to two months and that the agglutination value of the serum of such animals is also markedly influenced by subcutaneous malleinization, . . . and it seems that a mallein injection has almost the same action on the production of immune bodies in a horse as killed glanders bacilli."

These views are more or less confirmed by our own observations and experiments. In the preliminary stages of sensitization and immunization, after seven subcutaneous injections of mallein and during a subsequent interval of sixty days, the immunity reactions gradually ceased. However, after each restoration of immunity, by further injections and intervals, a serum of a higher titer was obtained and the duration period of immunity lengthened out, as indicated in the accompanying table. It may be added that this anti-mallein serum gave a higher titer when titrated with a suspension of killed glanders bacilli as antigen than with a solution of mallein as antigen. The titer on Feb. 7, 1923, was 0.002, or 500 units per cc, with mallein, and 0.001, or 1000 units per cc, with a bacillary suspension of glanders.

PRECIS OF ANIMAL EXPERIMENTS

PRODUCTION AND TITRATION (COMPLEMENT FIXATION) OF ANTI-MALLEIN HORSE SERUM
HORSE NO. 1—GREY GELDING

Date	Duration, days	Antiserum		Immunization		Remarks
		Titer	Units per cc	Injection No.	Mallein	
				(subcutaneous)		
June 10, 1921	1	2.5 cc	Preliminary experiment to ascertain the presence of specific antibodies in the serum in response to subcutaneous injections of mallein.
June 23, 1921	13	.....	.....	2	5.0 cc
June 30, 1921	20	.....	.....	3	7.5 cc
July 7, 1921	27	.....	.....	4	10.0 cc
July 21, 1921	41	0.1	10	5	12.5 cc	
Aug. 4, 1921	55	0.1	10	6	15.0 cc	
Aug. 12, 1921	63	0.1	10	7	17.5 cc	
Oct. 10, 1921	122	Interval of 60 days in which the immunity reactions disappeared.
Oct. 19, 1921	131	8	20.0 cc	Immunity reactions restored and raised.
Oct. 28, 1921	140	0.04	25	.....	.....
Dec. 6, 1921	179	9	20.0 cc	Showing the duration and decline of immunity reactions. Period—147 days.
Dec. 12, 1921	185	0.01	100	.....	.....
Jan. 7, 1922	211	0.01	100	.....	.....
Jan. 14, 1922	218	0.04	25	.....	.....
Jan. 28, 1922	232	0.05	20	.....	.....
Feb. 25, 1922	260	0.06	16	.....	.....
Mar. 16, 1922	279	0.08	12	.....	.....
April 3, 1922	297	0.1	10	.....	.....
May 2, 1922	326	0.14	7	.....	.....
				(intravenous)		
July 10, 1922	395	10	10.0 cc	Serum used in human cases of glanders.
July 17, 1922	402	0.0025	400	.....	.....
Sept. 18, 1922	465	0.01	100	Serum used in human cases of glanders.
Jan. 15, 1923	584	0.02	50	11	15.0 cc	
Jan. 19, 1923	588	0.01	100	.....	.....
Jan. 20, 1923	589	.....	.....	12	30.0 cc
Jan. 26, 1923	595	0.002	500	.....	.....
Jan. 31, 1923	600	0.002	500	.....	.....
Feb. 7, 1923	607	0.002	500	.....	.....

Subsequently to the immunization experiments herein recorded, this horse has received, during February, March and April, six intravenous injections of a suspension of *B. mallei* subjected to different degrees of heat, commencing with the first injection at 100° C. and finishing with the last at 50° C. The serum titer during this period fluctuated between 0.005 and 0.0016 (200 to 800 units). During May and June two intravenous injections of a living and very virulent culture of *B. mallei* have been given,—(small intraperitoneal inoculations into guinea pigs cause death in seven to ten days). No clinical evidence of glanders has been manifested up to the present date; the complement-fixation titer of the serum maintains itself at about 0.0025 (400 units), while the agglutination value lies between 1:3000 to 1:5000; periodical blood inoculations into guinea pigs have all proved negative.

Glanders, fortunately, is not a common disease of man. But,

has been stated by Robbins,⁵ in his analysis of 156 cases collected from the literature, "it is to be remembered that the published cases of chronic human glanders are but a small proportion of those which have been correctly diagnosed, and there is reason to fear that the vast majority of such cases of glanders in man have been included under some other heading in mortality statistics." "The curability of chronic glanders," Robbins states in his conclusions, "has been greatly over-estimated. Scarcely six per cent of these cases were definitely cured. The duration, including many incomplete cases, averaged fourteen and one-half months. It varied between six weeks and fifteen years".

In speaking of a cure in human glanders one must be very guarded and take into account the tendency to remissions after periods of quiescence. However, the results obtained in the three cases dealt with in this paper certainly indicate that specific serum treatment has a high and definite value in promoting a cure of this gruesome malady.

REFERENCES

- ¹Watson, E. A. and Heath, L. M.: Jour. Amer. Vet. Med. Assn., LXI (1922), 5, p. 503.
²Bell, Gordon: Jour. Can. Med. Assn., XIII (1923), 3.
³Brocq-Rousseau, Forgeot and Urbain: Am. Inst. Past., XXXV (1921).
⁴Mohler, J. R., and Eichhorn, A.: U. S. Dept. Agri. Bull. No. 70, April 15, 1914.
⁵Robbins: Studies from the Royal Victoria Hospital, Montreal, Vol. 2, No. 1, 1906.

DISCUSSION

CAPT. R. A. KELSER: One of the most striking things in Dr. Watson's paper is the seemingly small dose of serum that was administered in connection with these cases of glanders in man, and I would like to ask Dr. Watson if there was any particular reason for not giving larger doses?

DR. WATSON: In the first case mentioned serum-treatment was commenced when the patient was in a state of collapse with nausea, vomiting and headache; the pulse rate was very slow, and the physicians proceeded very cautiously in the administration of the serum. However, in three or four days they were apparently getting a rapid response, and they did not push the treatment as far as they might have done.

Dr. Jackson says, in a letter, that he certainly would start another case with at least five cubic centimeters and probably double or treble that amount. He regretted afterwards, in this first case which occurred, that he did not give a more intensive treatment. The case had been running for one year before treatment was started and has at the present time recurred, although it is healing up again, as he told me in his last letter, and of course more intensive treatment is being given. In the other cases, glanders was diagnosed at the outset, on the appearance of the first lesions, and the administration of the serum immediately afterwards, though in small doses, gave very quick results.

CAPT. KELSER: I have raised the point because in connection with anthrax in man we have had occasion to furnish serum for human use, and the smallest dose recommended has been 35 cc, and I have knowledge of several cases where they gave as much as 150 cc intravenously. In one or two cases they had serum-rash, but in no case that I know of did they have a typical anaphylactic shock following the initial injection.

CHAIRMAN REED: Are there any further questions, or is there any further discussion?

Of course, we know that glanders is not such a common disease in human beings, but it is, as Dr. Watson hinted, I believe, far more common than is publicly realized.

BOVINE INFECTIOUS ABORTION: SOME LABORATORY FINDINGS AND CONCLUSIONS WHICH PUZZLE THE PRACTITIONER¹

By W. L. WILLIAMS, *Ithaca, N. Y.*

Veterinary science constantly increases in its scope. It is becoming more and more impossible for a veterinarian to attain high proficiency in both laboratory and clinical fields. Yet the solution of each important problem demands the application of both clinical and laboratory knowledge. It falls to the lot of the practitioner to make the final application of veterinary science to the control or prevention of disease. A highly essential part of such knowledge is derived from the laboratory. In turn the need for laboratory investigations is learned through the clinician. Efficient veterinary service is possible only so far as clinicians and laboratory men work together with mutual understanding and sympathy. In no veterinary field is this more essential than in the genital infections interfering with reproduction. In this problem abortion occupies a conspicuous place.

Beliefs upon abortion are dependent in part upon tradition and partly upon modern research. In tradition, the causes of abortion were cosmopolitan. There were major groups of causes each comprising an infinite variety of minor elements. They included mechanical injuries (falls, blows), psychic disturbances (fright), weather influences (heat, cold, drought, rainy weather), foods (damaged and undamaged of every known species), water (cold, stagnant), infectious diseases (foot-and-mouth disease, tuberculosis). When a more concrete conception of contagion developed, there arose the belief in one great dominant infectious disease, which invaded the uterus of the pregnant female, destroyed the fetus or fetuses and caused their expulsion. Traditionally, it was an infection affecting only the pregnant uterus, the intra-uterine young or both. It caused all, or practically all, abortions due to infection and was responsible for nothing but abortion. It occupied an unique, if not mysterious position in pathology. With the development of bacteriology, breeders and veterinary practitioners looked forward eagerly to the identification of this traditional micro-parasite, trusting that the infection would then be brought under effective control. The honor of the

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

discovery of this prophetic bacterium fell to Professor Bang in 1895.

Since the discovery of the *B. abortus*, by Bang, researches upon abortion have been directed almost exclusively along bacteriological or laboratory lines and almost wholly confined to the Bang bacillus. Clinical observations have been virtually abandoned or the records of them have been submerged beneath the avalanche of laboratory publications. The general results of laboratory investigations during the past twenty-eight years have included: (1) a contraction in the volume of abortions believed due to other causes than infection, with a corresponding expansion of contagious abortion; and (2) a growing modification of the belief that abortions due to contagion were necessarily all caused by one infection.

The biology of abortion has dominated the field to the exclusion of important clinical and macroscopical post mortem studies. The emphasis has been placed upon what bacterium causes abortion, not upon how infection leads to the expulsion of the fetal cadaver. The failure to take into account the manner in which abortion is brought about by bacteria has left the veterinary practitioner and the breeder in a confused state of mind. If either breeder or practitioner were asked in what manner infection causes abortion, he would as a rule be wholly unable to explain. During the past nine or ten years, I have recorded the autopsic findings upon a number of pregnant females apparently ready to abort, and upon a considerable number which were destroyed immediately after having aborted. In all these there was found a definite and intense endometritis at the cervical end of the uterus. Radiating therefrom toward the ovarian extremity, the inflammation gradually diminished or disappeared. Clinicians with experience in bovine practice know perfectly well that retained fetal membranes, which so often accompanies abortion as well as calving, begins at the cervical end of the uterus and the process of detachment is last completed by maceration or otherwise at the apex of the horn.

Based upon the very scant available clinical data the natural conclusion is that cervical endometritis is a constant and essential lesion in abortion. No data tending to refute this conclusion have been recorded. Still it remains a vital question in the intelligent comprehension of abortion. Its final solution must rest chiefly with the laboratory worker because it is he to whom the opportunity comes to slaughter aborters immediately after

the act and make a careful study of the lesions present. If cervical endometritis is in fact the basic lesion of abortion, and if it be determined that such lesion is produced by infection only, then an important foundation will have been established upon which a clearer conception may be built. The absence of such a foundation is largely responsible for the existing confusion and uncertainty. It is desired to discuss some of the laboratory teachings which puzzle the clinician, in the hope that there may be brought about a clearer understanding.

THE GENERAL DISTRIBUTION OF ABORTION

Some form or forms of destructive genital disease causing many abortions have existed in all lands from the beginning of history. Regardless of this fact, there is met again and again categorical statements such as "The disease (contagious abortion) has been present for many years in this country (United States) and has now spread to every state in the Union.¹⁷" The reader is justified in assuming the statement to mean that abortion has recently invaded some unnamed states or territories. There is no intimation that it has yet invaded Canada. Such statements, though common, are confusing. American cattle are derived from Europe, in every corner of which abortion has been common and serious throughout history. Cattle could not be brought to America without infections causing abortion in their native lands, and cattle could not be taken from one state to another without carrying their genital infections along.

Naturally some breeders or groups of breeders may, through misconception or self-interest, claim that certain herds are free from contagious abortion. If the term is restricted to abortions caused by one individual organism and the diagnosis is based upon a given method, the contention might sometimes be true. It has been stated that Channel Island breeders claim their herds free from contagious abortion. But they abort liberally on shipboard and after their arrival in America without known exposure to a new contagion.

It is unfortunate and confusing that such statements should be made by highly influential laboratory workers. Unless supported by evidence more conclusive than any yet published the statements grossly mislead breeders and practitioners. It would be unfortunate if the officials of Colorado having legal power to do so should quarantine against New York cattle because of contagious abortion. Certainly a Colorado breeder purchasing

cattle in New York needs be careful to select animals from the cleanest herds, but he should avoid concentrating his attention so closely upon the dangers of introducing abortion from New York that he neglects the abundant genital infections already present in the cattle of his own state.

THE FREQUENCY OF ABORTIONS IN HERDS

It is impossible to state with accuracy the absence, in herds, of infection capable of causing abortion. Infected and non-infected herds are often mentioned but a supposedly non-infected herd may suddenly be devastated by a storm of abortion without a trace of evidence of introduction. What is usually meant is that so far as the speaker knows the *B. abortus* is not present. The hearer perhaps generally understands him to mean that no infections are present competent to cause many abortions or other serious interferences with reproduction. The breeder may categorically deny the recent occurrence of abortion from contagion in his herd, accrediting them all to accident, yet vehemently believe a corresponding number of abortions in the herd of a neighbor as proof of a highly dangerous infection.

The practitioner commonly knows only of those abortions resulting in dystocia or retained fetal membranes or which otherwise distinctly alarm the owner. In other cases the owner keeps his own counsel, hopes for the best and forgets.

Laboratory workers are almost the sole molders of public opinion upon abortion. They prepare essentially all the bulletins. These go to almost every breeder and veterinarian in the nation. The laborator accepts the statement of the breeder that he does not have or has not had contagious abortion in his herd and in his reports and bulletins speaks of such non-infected herds as actually having a tangible existence. As a rule, the laboratory worker is the most exacting of all men in his details but in this particular place he accepts, and repeats as a scientific fact, very questionable hearsay evidence. If a breeder wishes to compute the reproductive efficiency of his herd for a year he must first determine correctly the number of females of breeding age on hand at the beginning and end of the year, and also all those which have entered or left the herd during the period with the duration of their stay. He must determine what pregnancies existed at the beginning and end of the year and the duration of each at the time of inventory. When to these are added the

number of healthy calves produced during the year, he has the required data for computing his results.

Such is not the method of most breeders and laboratory workers. They too largely base their computations upon the number of fetal cadavers known to have been expelled. The expulsion of embryos one-half to one inch long is occasionally observed and automatically is classed as abortion. Perhaps fifty or more such embryos are expelled unseen for each that is observed but they cannot enter into such computation although the loss in reproduction is identical.

In any intelligent computation of breeding efficiency, abortions have widely differing values. If a cow expels a fetal cadaver at four weeks, the membranes accompany it, uterine discharge is scant and with intelligent handling she may be in safe breeding condition in another four weeks, or a total loss of eight weeks. If, however, she expels a fetal cadaver at forty weeks, the severe metritis, already present, grows worse, the fetal membranes are retained, her life is in definite peril and her breeding life in even greater jeopardy. She can scarcely be ready to breed again until at least twelve weeks have elapsed, a total loss of breeding time of fifty-two weeks, or six and one-half fold as great loss of time and even greater comparative danger to physical and reproductive life. The prevailing method of computing all breeding losses upon the ratio of abortions to births is grossly misleading and unworthy to be classed as scientific. It is worse for one cow to abort at forty weeks than for six cows to abort at four weeks.

Laboratory workers have injected into their method of computing reproductive efficiency another element which defies all efforts of the clinician to understand. In recording the results of breeding under experimental attempts to cause or to prevent abortion, they submit three groups; *sterile*, *aborted*, and *calved normally*. The line between *sterility* and *abortion* is clear enough. If a calf has not been born and it is not known that a fetal cadaver has been expelled, the diagnosis of *sterility* is beyond cavil. If it is known that a fetal cadaver was expelled, there can be no question about abortion. Between abortion and physiologic birth, the practitioner constantly encounters an endless variety of pathologic states which pass one into another imperceptibly. The laboratory worker steps abruptly from abortion to "calved normally" with no provision for the intervening gradations, and not the faintest intimation is given where the dividing line is drawn.

The practitioner habitually encounters premature birth which is in contact on the one hand with abortion, on the other with full-term birth. Perhaps most will agree that when a calf is born at less than 265 days, it is premature and that if it is over 275 days it is full term, leaving a debatable zone of ten days. Cows which calve prematurely commonly continue to suffer from endometritis which caused the premature expulsion and frequently have retained afterbirth. The prematurely born calves frequently die from sepsis, dysentery or pneumonia. Those which survive are generally undersized and when heifers reach breeding age they are largely sterile or abort in first pregnancy. Laboratory workers do not state whether they class these as "aborted" or "calved normally."

The clinician is summoned to attend many cows with a duration of pregnancy of 275 days or over in which parturition is slow owing to the presence of metritis. The fetus may be dead or extremely ill so its reflexes are depressed or destroyed and it fails to assume that physiological attitude which renders birth practicable. Or the metritis present causes uterine inertia which prevents that organ from performing its part in the expulsion of the fetus, and makes obstetric aid desirable. After the fetus has been expelled or removed, the underlying metritis persists and perhaps the fetal membranes are retained. The fetus may be expelled, dead or mortally ill or may break down with dysentery in an hour or two.

I have elsewhere shown² in a herd where abortions were frequent and genital infections were virulent, that parturition at or about full term required anywhere from 30 minutes to 35 hours, sometimes with final resort to obstetric aid, and that the expulsion of the afterbirth required from seventy minutes to thirty-six hours, with aid in the tardier cases. Between such extremes were all the variations the numbers would support. The clinician encounters these variations constantly, he believes some of them are physiological, he knows perfectly that many of them are not. Apparently, however, the laboratory worker designates all these as "calved normally." These and other variations in parturition are observed constantly by the practitioner, far more frequently than he sees abortion and in herds where an abortion rate of twelve to fifteen per cent of pregnancies prevails, he sees far more pathologic than physiologic births. If laboratory workers intend to say that all pregnant cows which do not abort, calve physiologically, clinicians cannot accept the

statement as true. If it is meant by "calved normally" that the calf was expelled, or removed by traction, embryotomy or otherwise and that the cow and calf each lived or died according to chance, then the term is meaningless. To state that in a large herd or group of herds a certain percentage of females were sterile, another aborted and that the remainder *calved physiologically* is such a flat contradiction to all clinical experience that it cannot be understood.

It would enormously reduce confusion to breeders and clinicians if in their recorded data, laboratory workers would divulge the average duration of time required for the production of a calf in a herd or group of herds, the duration of parturition, and of the expulsion of the fetal membranes along with the health of the cow and calf at say five days *post partum*. Such data would not reveal the number of fetal cadavers expelled, seen or unseen, but what is infinitely more valuable, it would indicate the sum total of the interferences with ideal reproduction and afford a secure scientific basis for their study. This would fix the biologic cause of neither sterility nor abortion but would establish an understandable point of departure for their determination.

When a laborator speaks of a non-infected herd, the clinician holds no key to his meaning. This may be well illustrated by two references to Sir John M'Fadyean. In one case³, thirty-nine heifers in first pregnancy were driven three and one-half miles by a boy and a dog. In litigation which resulted it was testified that at intervals of from 36 to about 180 days after the drive, 11 (28.2%) of the heifers aborted: Eight (20.5%) calved prematurely. At least 48.7% of pregnancies terminated pathologically. Basing his conclusions upon blood tests of some of the animals, M'Fadyean testified that in those cases (and presumably also the others) contagious abortion was not present. Technically it was a non-infected herd.

In a series of highly interesting contributions upon the elimination of contagious abortion from herds through the removal of infected individuals by means of blood tests, one large herd⁴ is especially mentioned from which M'Fadyean believed he had eradicated the infection within one year. His records show that numerous abortions occurred in the resulting non-infected herd, the causes of which were undetermined. The comparative frequency of abortions in the infected and non-infected state is not revealed, and it is not stated whether the reproductive

efficiency of the herd was increased or decreased by the eradication of contagious abortion. So it follows that neither practitioner nor breeder has any conclusive evidence of the breeding value of a herd designated as non-infected by the prevailing standards.

DIAGNOSIS

When abortion occurs in a herd the prudent owner is interested in a reliable diagnosis. Tradition has supplied him with a belief in such a wide variety of causes, that he desires to learn the identity of the one responsible in his case. The laboratory workers are substantially agreed that accidental abortions are of no economic interest and except that recently some of them attach importance to abortions believed due to a vibrio, they quite unitedly agree that infections other than the Bang organism are unworthy of consideration. Hence aside from the recent converts to the belief that vibrio infection is of scientific and economic interest, there is but one cause of abortion in cattle worthy of attention; that due to *B. abortus*.

This produces immediately an extremely puzzling dilemma for the practitioner. The owner desires a differential diagnosis. The practitioner is confessedly and utterly incompetent to make the diagnosis. The owner knows only that the abortion has occurred. The laboratory worker is the only individual who claims to be able to differentiate, and upon him the practitioner must rely for a decision.

Referring again to M'Fadyean's testimony³ he convinced the jury that the abortions in question were not due to contagious abortion. This left the practitioner in charge in a decidedly sorry predicament. He must then decide between accidental abortion or abortion due to an infection of no consequence.

It was hazardous for him to diagnose accidental abortion. He could not readily explain to his client why accident should cause the fetal death at periods of 36 to 180 days subsequent to the drive when among born animals fatal accidents generally destroy life immediately or within a few days. In born animals fatal accidents leave visible marks, but none appeared on the fetal cadavers. He might have said that the violence had caused detachment of the placenta and thus induced fetal death but probably most of the heifers had retained, instead of prematurely separated, fetal membranes. He had no opportunity to destroy the aborting heifers immediately and examine their uteri. Only

laboratory workers, in public service, working upon experimental or publicly owned cattle, have opportunity to destroy a cow immediately after aborting and to make an autopsy. Had he enjoyed that opportunity and killed some of the aborters at once, he would have found, according to all records upon this phase of abortion, an endometritis which was most intense at the cervix and thence radiated toward the ovarian end of the uterus. Then he would have been puzzled to explain the uniform occurrence of cervical endometritis referable to accident. No laborator or other investigator has yet described the post-mortem lesions of accidental abortion and no one has explained or tried to explain how mechanical violence could cause abortion.

If the practitioner had resorted to the other alternative and ascribed the 28.2% of abortions to an infection of no consequence, his path would have been equally puzzling. Few veterinary practitioners possess the eloquence to convince the owner that an infection causing 28.2% of abortions and 20.5% of premature births is of no consequence. If the owner is so inquisitive as to inquire concerning the identity of the inconsequential bacillus, the practitioner is wholly at sea. Except for a few recent believers in vibrionic abortions, the laborators virtually all assert that no proof exists that other bacteria possess such powers.

Even if the practitioner constructs a diagnosis which soothes his own conscience, his puzzle is not yet solved. He has difficulty in describing how to handle the herd. Those laboratory workers who manufacture abortion remedies have none on sale for accidental abortion. The official laboratory worker offers no advice for the control of abortions due to infections of no consequence. If the genuine bovine infectious abortion is diagnosed, there is still confusion ahead. The laboratory workers largely teach at present that the most promising, if not the only, remedy for contagious abortion is more of it; that on top of the infection present, more is to be added to produce valuable immunity. Some of them say, and the practitioner needs explain the logic of it to his client, that after a cow once aborts, she is generally immune to the Bang organism, but she may abort the following year from some other infection. It is, therefore, important that the cow be given a large dose of living abortion bacilli, soon after she aborts the first time, in order to protect her against a subsequent abortion due to other bacteria. If the practitioner can surmount his misgivings and recommend more abortion infection to destroy that which is present, the breeder is fairly susceptible the first

time, rather skeptical the second and when he advises the living cultures a third time, he is liable to find his client as immune to advice as his cows are to a third abortion.

So it is that abortion, as taught generally by laboratory workers, is the most perplexing and humiliating problem the practitioner has to face. In other veterinary fields the clinician conscientiously regards himself as scientifically informed and competent to aid his client but from the field of infectious abortion he devoutly wishes he might escape.

In the diagnosis of contagious abortion the most practical method without sacrificing animals is presumably by the agglutination or complement-fixation tests. In the application of these tests to abortions occurring in clinics such as the ambulatory clinic of the New York State Veterinary College and others, combined with culture searches and guinea pig inoculations from the abort and its membranes, the presence of *B. abortus* is recognizable in about 50% of cases. But in many of these other bacteria are also present. What relation, if any, they have to the abortions is not known.

The blood of most calves at birth will not agglutinate at 1 to 10. Laboratory workers fix various standards for diagnosis, from 1-25 up to 1-100 and even higher. It is a purely quantitative test and each laborator is a law unto himself. There is no proof that an agglutination of 1-10 does not indicate one-tenth as severe infection as 1-100. Admittedly, the 1-10 agglutination generally indicates nothing serious while 1-100 does, but that is a question of prognosis. Carpenter⁵ has recently shown that when young calves are fed upon abortion-infected milk, the bacteria are recoverable from the lymph glands about the pharynx. Their blood did not react to the agglutination test. It was not shown that they caused permanent infection. They were healthy calves, apparently able to overcome the amount of infection to which they were exposed. This must often be true because most dairy calves are exposed, so that uniformly permanent and destructive infection would mean the extinction of domestic cattle.

Detre and Rohonyi⁶ studied fifty-two animals by agglutination test and by smears from their vaginae. In sixteen of these abortion bacilli were not recovered from the vaginae. In five (31%) their blood agglutinated at 1-10 up to 1-200, while in eleven (69%) the agglutination titre was 1-400 up to 1-3000. Abortion bacilli were recovered from the vaginae of thirty-six animals. In

twenty-eight (78%) of these, the blood agglutinated at 1-10 up to 1-200 and in eight (22%) the agglutination titre was 1-400 to 1-3000. In other words, those animals from which the bacteria were not recovered from the vaginae showed an average agglutination titre of 1620 as compared with 440 in those yielding bacilli from their vaginae. They offer a plausible explanation for the phenomena which has no relation to the present purpose.

There has long been known a severe disease in man, termed undulant, Malta or Mediterranean fever. It has been concluded, apparently upon indisputable evidence, that the disease is due to the ingestion of goat's milk containing the organism designated *Micrococcus*, or *Brucella melitensis*. The disease is seen in Texas and other southwestern states where milch goats are common. Mohler and Eichhorn⁷ assert that the melitensis organism is pathogenic for sheep, goats, cattle and horses. They state "The most important symptom which is observed in goats affected with Malta fever is the frequency of abortions which result in the course of the disease. Some authors estimate that expulsions of immature fetuses occur in 50 to 90% of the pregnant animals, and abortions in affected animals reoccur also during the succeeding and even at the third gestation following the infection." This reads strikingly like a paragraph from a dissertation upon bovine infectious abortion. Writers upon medicine relate that in undulant fever, men commonly suffer from orchitis, which is suggestive of the orchitis noted in bulls during contagious abortion.

Most laboratory workers declare that by agglutination and complement-fixation tests, smears, cultures and guinea pig inoculations they are able to recognize safely and positively *B. abortus* infection. Some eminent bacteriologists deny this. Evans⁸ made exhaustive comparative studies of the organisms of cattle abortion and Malta fever, the results of which have been recorded in detail. She took two groups of 4 pregnant guinea pigs each and inoculated one group with the abortion, the other with the Malta fever organism. Within a few days, three (75%) of each group had aborted. She could not differentiate the two organisms morphologically, culturally or by the agglutination and complement-fixation tests. Meyer and Shaw⁹ after a very extensive study of the two organisms say "A comparative study of 21 cultures of so-called '*Micrococcus*' *melitensis* obtained from various sections of the world and of 32 cultures of *B. abortus* (Bang) isolated in this country and England justifies the follow-

ing conclusions: The causative organism of undulant fever of man and of Malta fever in goats cannot be distinguished morphologically or biochemically from the organism responsible for infectious abortion in domestic animals." They found that in old cultures there was a slightly deeper pigmentation with the Malta fever than the abortion organisms but this was merely quantitative and recognizable only when two cultures of the same age were carefully compared. Meyer, Shaw and Fleischner¹⁰ further showed that the inoculation of guinea pigs gave the same results with each organism but a larger dose of *melitensis* than *abortus* was required to cause the classic changes in liver, spleen and other tissues. The two organisms also caused undulant fever in monkeys, though it required larger doses of *abortus* than of *melitensis* to make the monkeys sick. They state: "Eliminating all conceivable sources of error, the data which will be presented conclusively demonstrate that *B. melitensis* can provoke in a certain percentage of guinea-pigs an infection indistinguishable from abortion disease." Here is a most intricate puzzle for the veterinary practitioner.

Each infection causes abortion and both are pathogenic for cattle, goats, sheep and horses. Kennedy, cited by Zeller¹¹, records that the blood serum and milk of many of the dairy cows, in the vicinity of London, responded to the agglutination test for Malta fever. This confused Kennedy greatly and caused him to seriously doubt the test, as it was in absolute conflict with clinical observations. People using the milk did not contract Malta fever.

Health authorities are at present agitating the control of undulant fever in man by discontinuing, or controlling the use of raw milk from goats. Apparently it is impracticable to differentiate between Malta fever and abortion infection and each is pathogenic for goats and cows. In fact some high authorities have ventured to suggest that Malta fever of man is really due to a highly virulent strain of abortion bacillus acquired by its habitat in the goat, just as others think that swine abortion is due to the cattle abortion bacterium of exalted virulence. The goat industry has acquired considerable importance in the United States and some members of our profession are deeply interested in goat diseases. With the present knowledge of Malta fever and its indistinguishability from cattle abortion, any formidable movement to prevent undulant fever in man

by the control of Malta fever in goats, will prove highly perplexing to veterinary practitioners who may be involved.

Malta fever is not alone in supplying a puzzle in the abortion diagnosis problem. Fontaine and Lütje¹² applied the agglutination and complement-fixation tests for bovine infectious abortion to 3419 horses, with seventeen (0.5%) reactions at a titre of 1-800 or over. Twelve (70%) of the reactors had fistulous withers. There were 101 animals with fistulous withers with 11.9% of reactions and 3318 free from fistulous withers with 0.15% reactions. The proportion between reacting horses with and without fistulous withers was 79:1. After recovery from the fistulous withers the horses were negative to the abortion test. Short bacteria were obtained from the abscesses of four horses, which they were unable to differentiate in smears or cultures from the Bang bacillus. A few samples of blood from horses with fistulous withers have been tested recently in this country for abortion infection and thus far appear to substantiate the findings of Fontaine and Lütje.

While a large group of laboratory men, who are preeminently responsible for the current beliefs of clinicians and breeders regarding contagious abortion assert that they can definitely diagnose the infection by laboratory methods, a very small group of eminent workers are equally positive that it is impracticable. The first group submits no data in support of its contention, the second offers abundant convincing evidence. Based upon available evidence it may be safely said that the bacteriologist must identify the bacterium before him upon his knowledge or belief regarding the species of animal from which it was derived. If he knows or thinks it emanated from a cow, it is *B. abortus*, from a goat, *M. melitensis* and from a horse, a bacillus found in some cases of fistulous withers.

Horses, cattle and goats are frequently in intimate association. *M. melitensis*, *B. abortus* and probably the bacillus seen in fistulous withers is each infectious for all three species and may therefore pass from one to the other so that a bacterium derived from one of these animals may have invaded it only recently from one of the other species. When Kennedy¹¹ found that the blood and milk of a large percentage of dairy cows about London reacted positively to the test for Malta fever he escaped falling into serious diagnostic error only by the remoteness from any center of undulant fever in man. Had the cows been in Malta or other Mediterranean locality, or had cases of undulating fever been

developing in London, all the reacting cows would have been condemned.

BIBLIOGRAPHY

- ¹An. Rep. U. S. L. S. S. A., 1922, p. 92.
- ²Williams, W. L., Researches upon contagious abortion of cattle. An. Rep. N. Y. S. Vet. Col., 1914-1915, p. 88.
- ³McFadyean, Sir John, Testimony in Chadwick vs. Gorman. Vet. Rec., Mar. 30, 1912, p. 621.
- ⁴McFadyean, Sir John, Researches regarding epizootic abortion. Jour. Comp. Path. and Ther., 34 (1921), p. 48.
- ⁵Carpenter, C. M., Bacterium abortum invasion of the tissues of calves from the ingestion of milk. Unpublished. Presented at meeting of the New York State Veterinary Medical Society, July, 1923.
- ⁶Detre and Rohonyi. Ueber die Diagnostik des infectiösen abortus des Rindes mit Hilfe der Agglutinations- und Mikroscopischen Untersuchung. D. T. W., 38 (1922), p. 345.
- ⁷Mohler, J. R. and Eichhorn, A., Malta fever in Texas goats. Twenty-eighth An. Rep. B. A. I., 1911, p. 119.
- ⁸Evans, Dr. A. C., Further studies upon Bacterium abortus and related bacteria. Jour. Inf. Dis., XXII (1918), p. 580.
- ⁹Meyer, K. F. and Shaw, E. B., A comparison of the morphologic, cultural and biochemical characteristics of *B. abortus* and *B. melitensis*. Jour. Inf. Dis., XXVII (1920), p. 172.
- ¹⁰Meyer, Shaw and Fleischer. ib. XXXI, Aug. (1922), p. 161.
- ¹¹Kennedy, cited by Zeller, H., Weitere Untersuchung ueber das Seuchenhafte Verwerfen des Rindes., Arch. W. and Prakt. Tierh., 49 (1922), p. 65.
- ¹²Pontaine und Lütje, Beiträge zur specifitätsfrage der complementbindungsmethode bei der rotzkrankheit, Zeitschr. f. Veterinarkunde, Vol. XIII (1919), p. 2.

DISCUSSION

PRESIDENT WELCH: Gentlemen, you have heard one of the most important papers of the meeting. It is open for discussion.

DR. D. H. UDALL: I was very much interested in this paper. Dr. Williams brought out some points of far-reaching significance, not only from a professional standpoint, but perhaps from a social standpoint, and without any doubt from a legal standpoint. Almost daily, certainly at least weekly, veterinarians in practice are asked by owners, following an abortion, following sterility, following retained placenta, "Is this contagious abortion?"

We have come to assume that he means infection with *B. abortus* (Bang). How are we to answer correctly? He has received through the press certain impressions as to the significance of infection with *B. abortus* (Bang) and of the proper method of handling such infections. Often his conception of the proper handling of these cases is at variance with the experience of the clinician. It is important, therefore, for the clinician to have some reliable bacteriological method of diagnosis.

There is nothing definite on the extent to which a clinician or a laboratory man may go with respect to the collection of material or the extent of its examination. We have definite knowledge of the amount and kind of material to be obtained for making a diagnosis of tuberculosis. The laboratory man has very definite knowledge of his limitations concerning laboratory examination of that material. When it comes to this disease, diseases of the reproductive organs, there are no such limitations.

We do not know after the material has been examined whether an animal is infected with the Bang bacillus. One may assume that the agglutination test is highly efficient. It is not infrequent, in routine examinations of herds, to obtain repeated negative reports upon animals that abort. Upon examination of the placentae of such animals the *B. abortus* organism may be found. One can not always depend upon the blood test, and the same is true of the milk. This experience is not rare. A cow that has given negative agglutination tests on blood examined at three-month intervals may deliver a calf at full time and reveal *B. abortus* (Bang) in the uterine exudate when an examination of the placenta itself is negative. Should such an animal be reported as infected with *B. abortus* (Bang)?

The topic discussed by Dr. Williams is of great importance to the clinician. He must reply to the owner in regard to the nature of infection in the reproductive organs. Responsibility for making an important decision rests upon him. Caution and conservatism should be observed in the wording of laws and regulations intended to control genital infections. The veterinarian needs

to keep the peace with his associates, and he has certain public obligations. It is highly essential that principles finally adopted as effective in the diagnosis of a disease should be sound and free from controversy. Final decision should be withheld until we have knowledge of all of the different phases of the disease.

Articles on abortion often lead one to infer that most of the chronic diseases of the genital organs associated with sterility are secondary to infection with *B. abortus* (Bang). It is not infrequent to find herds where most discouraging infections of the genital organs exist and in which there is no evidence whatever of the presence of *B. abortus* (Bang.) Blood, milk, uterine exudate, placenta and fetuses are negative. Who can say that such a condition is secondary to something that has vanished, or that it is not due to some organism found in the material?

It is not infrequent for a clinician to conduct work where abortion is fairly frequent, and from which no evidence of *B. abortus* (Bang) can be obtained after repeated examinations of the blood and other material.

In the light of the bulk of our present literature such experiences are confusing to the clinician. And when one recalls that cattle owners are more familiar with the literature upon affections of the genital organs than with that of any other system, that much of it is positive, clear and final in its style, it is not difficult to appreciate the fact that clinicians are not only confused, but are sometimes embarrassed. In this connection may it not be appropriate to suggest that less confusion would result if conclusions based upon a large volume of work in a comparatively small field were not extended to cover the entire scope of veterinary medicine, both experimental and natural?

DR. E. A. BRUCE: I would like to ask Dr. Williams if *B. melitensis* is the organism which presumably causes abortion in goats and cattle and undulant fever in man, how it is that on the Pacific coast, as far as I know, at least as far as British Columbia is concerned, I have not had any reports of abortion in goats, or any cases of undulant fever in men, but there is lots of abortion in cattle?

DR. W. W. WILLIAMS: In clinical work the relation between infection by *B. abortus* and the actual incident of abortion frequently becomes very obscure. In one herd with which I came in contact, about three years ago, there were twenty-three mature animals which had given birth to one or more calves. Of these there was only one animal which was negative to the agglutination test for *B. abortus* infection. This animal aborted, whereas the other animals of that group had never been known to abort.

In the past three years the herd has essentially doubled in size. The younger animals which were negative three years ago have since become positive. Yet with the high percentage of positive agglutinations, only two or three abortions have occurred in that whole group during the past three years.

Another instance is that of a herd of about 125 females, in which more or less work upon the genital organs has been done for several years. During the past two to two and one-half years, twenty-one abortions or premature births have occurred. It had been the general practice in this herd to examine the genital organs before service to see that they were normal and also in most cases to administer a uterine douche before service. With seventeen out of the twenty-one abortions or premature births, there had been, however, no examination or treatment before service. Of the remaining four, three had definite clinical evidence of salpingitis and the other a severely indurated cervix, the cervical canal being partially lined with eschar tissue. Thus, out of the twenty-one abortions or premature deliveries, the cause for abortion in four of these cases could be explained by the presence of definite foci of infection. During the same period, there had been over sixty animals in the herd treated before service and these did not abort.

In another herd having about eighty-five mature females, fourteen abortions occurred in one year amongst heifers in their second pregnancies, and with one exception, all of the abortions in the herd were confined to this group. These heifers all having exceptionally healthy deliveries of their first pregnancies, had received no treatment afterwards. Aside from this, it was not possible to point out any difference between their care and handling and that which

the rest of the herd had. The rest of the herd with the exception of the virgin heifers had uterine treatment before service. All of the mature animals had been affected with infectious dysentery one to two months before the abortions occurred, and this may have had some relation to the abortions. The pregnancies of the mature animals, aside from the ones in their second pregnancies, were, however, not affected.

Now it is puzzling to understand in these cases how treatment of the genital organs can prevent an animal from aborting if the infection were *Bacillus abortus*. This organism does not usually occur in the uterus at the time that the organs are treated, and it is not plausible to suppose that the treatment of the genital organs can have any great influence upon foci of this organism elsewhere in the body.

Clinical work cannot be safely conducted upon the basis of what is known about *B. abortus*. One herd may show a vast relation between *B. abortus* infection and the incident of abortion, and the next may just as emphatically deny the relationship.

DR. A. SAVAGE: I should like to ask Dr. Williams, if I may, although it is slightly beside the point, just what he understands by the term "infectious abortion." It seems to me that if one adopts the attitude that abortion is the premature expulsion of a fetal cadaver, then it ceases to be a disease because it becomes the result of several or many different factors. Even the infection factors alone seem bound to include a number of organisms which have been fairly well described, the organism of Bang, that of Dr. Theobald Smith, the organism of M'Fadyean and Stockman and others. If by abortion one is to understand the result of being infected by the Bang bacillus, then it seems that abortion is also to include Malta fever in goats, undulant fever in man, and probably fistulous withers in horses.

DR. B. T. SIMMS: Mr. Chairman, I hardly know what classification I would fall under. I fear I am neither fish nor flesh nor fowl, as I do too much field work to be called a laboratory man and too much clinical work to be called a field man.

There are conditions in my state which are different from those under which Dr. Williams works. I come from the Pacific Northwest but I feel I would like to say a few words about conditions which are obtaining there.

We do have, I assure you, districts that are free from abortion, both by clinical observations and by laboratory tests. By clinical observations I have seen farms in the southern part of the United States, too, which were absolutely free from abortions. By both clinical and laboratory tests we have found not herds, but entire districts, in the State of Oregon, that are free from abortion. Cattle owners, veterinarians and people who are in close touch have advised that there were no abortions in certain of our valleys in the mountainous districts. We have gone in and tested, by blood test, not one herd but the entire group of herds in such valleys and have found no evidence of the presence of the Bang organism.

On the other hand, where abortions have been present, where there has been clinical evidence of some disease that was causing premature expulsion, we have found evidence of the Bang organism.

In at least ninety-five per cent of the tests that we have conducted (and we conduct some few; in the last twelve months we have tested around five thousand cows in the State of Oregon, outside of experimental animals), cows which show clinical evidence of having aborted give us positive tests for the Bang bacillus.

We have found some one or two herds where there were abortions with no evidence of the presence of the Bang bacillus. The test certainly does run parallel to the act of abortion. Of course, I don't say (and I think no laboratory man has ever said it) that all positive reacting cows will abort but we do say most emphatically, in the State of Oregon, that aborting cows will react in ninety-five per cent or better of the cases.

In our state, too, we have observed some of these animals that are premature births and have followed them to maturity. We have found that if they were handled in a satisfactory manner, they would give us negative blood tests after they had passed the age of five or six months. Even though they

have come as early as 245 days, they have lived and from that on up. Those heifers, when they reached maturity, have bred for us and have given birth to live calves. They have bred very satisfactorily; they have given us negative tests and continued negative unless they were exposed to the Bang organism infection.

Gentlemen, I want to emphasize again that I am not referring to conditions in the Middle West or East. I know nothing of the conditions there, but on the Pacific Coast the Bang organism is definitely associated with the act of abortion, according to laboratory tests and guinea pig experiments. We do not have extensive outbreaks of abortion.

DR. UDALL: May I ask a question of the last speaker?

I infer that you base the diagnosis on the blood test and I would like to ask if more than one blood test is required to establish diagnosis, and, if the agglutination test is made, if the conclusions reached are accepted as evidence of reaction?

DR. SIMMS: In our laboratory we make three dilutions in running the agglutination test, 1-50, 1-100 and 1-200. We consider the test positive and that the cow is infected if we get agglutination in two of the dilutions. Occasionally we have made higher dilutions, and observed them fifty-two hours after the test is made, where the animal has recently been infected with abortion. Of course, a negative test today does not indicate that the cow will abort twelve months or fifteen months from now, but it has indicated in Oregon that that cow is not an aborter and will not abort in the next few weeks or within a period of four or five months.

DR. W. L. WILLIAMS: In replying to the first speaker, whose name I do not know, regarding the question of why melitensis and abortion infection are not present in goats in British Columbia, and why there is plenty of abortion in cows, I am quite unable to answer.

As used in the paper, I aimed to limit the term "infectious abortion" to the definition made by the Committee on Abortion of this Association; to the infection by the Bang organism. It could not be constantly so limited; but unless there is something in the context to indicate otherwise, the *B. Abortus* infection is meant.

I am sorry that Dr. Simms did not go farther with reference to the abortion-free herds. I know very well that many breeders are so built that they can forget a great many things and one of the things which they do forget is abortion. Abortion is not common in cows which run in mountains, because there is nobody with them to see the fetal cadaver expelled. That makes a very great difference in the incidence of abortion. We can only count those cases as abortion in which we have some reliable information to the effect that a fetal cadaver has been expelled.

In one large herd where I worked, the animals were running out in large paddocks of several thousand acres each, where the ground was very rough, with numerous boulders and fallen logs. The cattle were not seen regularly and while there was a sixty per cent breeding efficiency, that is, sixty calves per one hundred cows over a period of ten years, there were only about five per cent of abortions, and we had to call the other interferences sterility because it could not be seen.

PUBLICATIONS AVAILABLE

Sir Arnold Theiler wishes it to be known that the publications of the Union of South Africa, on veterinary subjects, are available to any veterinarian or institute making application for same to The Director of Veterinary Education and Research, P. O. Box 593, Union of South Africa, Pretoria. Sir Arnold desires full exchange of publications between the veterinarians of South Africa, the United States and Canada.

THE SIGNIFICANCE OF POST VACCINATION TROUBLE¹

By EDW. A. CAHILL,

Indianapolis, Ind.

During the past few years the pages of veterinary journals and the programs of meetings have been so crowded with discussions pertaining to differential diagnosis of swine diseases that the importance of this subject may be readily judged. It is interesting, however, to note that this enhanced interest in diagnosis came almost simultaneously with an increase in post-vaccination trouble cases.

The average practitioner who is favored with a desirable swine practice has been passing through a transitional period. A few years ago he shared the then prevailing belief that cholera was the only serious disease of swine and that the more or less mechanical injection of anti-hog cholera serum and virus was equivalent to a guarantee of future health. He rarely felt it incumbent upon him to warn his clientele that following any form of vaccination there is a small percentage of undesirable complications, that there is a difference between vaccination and immunity, or that the artificially acquired immunity following any form of vaccination is not absolute. Gradually it became apparent that one could not consistently retain this attitude and explain or even understand the altered field conditions which were being experienced. As a result the more astute observers began to attach greater significance to fine points of differentiation and small details which had previously been considered unimportant. As the transition progressed there came the realization that petechiae on autopsy denote a septicemia which may or may not be hog cholera, and that button ulcers indicate bacterial activity which may or may not be associated with hog cholera. This modern doctrine prohibits the belief that all sickness subsequent to vaccination constitutes a "cholera break" while the transition becomes complete with those who diagnose cholera only if the syndrome includes typical history, symptoms and lesions. Such diagnosticians are prepared to explain to their clientele that a certain percentage of individuals vaccinated against any disease fail to become immune on account of immu-

¹Presented before the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

nological factors as yet unknown. They likewise take into consideration the facts that pre-existing latent infections not infrequently become active when the host is subjected to the influences of a different antigen, or that immediately following vaccination a state of increased susceptibility offers an excellent opportunity for complications which may not be easily diagnosed.

WHEN EXPERTS DISAGREE

Not all members of the profession concur in this modified interpretation of swine diseases and when at the request of the owner a consultation is held to determine the nature of post-vaccination sickness, a difference of opinion not infrequently occurs. In such cases one consultant diagnoses a "cholera break" and advises immediate re-treatment. Our investigations indicate that such a diagnosis is frequently an exhibition of dogmatism based solely upon the presence of petechiae of various organs and entirely disregards the fact that there are lacking other features necessary to make a cholera syndrome complete. The other consultant may diagnose another disease or condition, because he realizes that the petechiae may be due to septicemias other than cholera and because there are observed certain symptoms and lesions which do not symbolize hog cholera. This difference of opinion naturally baffles the owner and frequently results in re-treating herds which we believe do not require such treatment, thereby causing an economic waste and endangering confidence in a valuable and necessary immunizing procedure.

Believing that when hog cholera is erroneously diagnosed and vaccinated animals unnecessarily re-treated, the psychological effects are more harmful than beneficial, there was felt the need of definite information to determine whether or not such cases actually exist. While the literature reveals a few scattered reports of the examination of blood from such cases we were unable to find the publication of any extended investigations pertaining to the subject. Because of these facts the experiments reported herein were undertaken.

Samples of blood were procured from as many cases as possible where swine sickened subsequent to vaccination and where the conditions simulated a so-called "cholera break". Many cases in addition to those included herein were studied but in the majority of those called to our attention a definite clinical diagnosis of some condition other than cholera could be made. In

every case included in this report the outstanding, post-mortem lesion consisted of ecchymoses or petechiation of various organs. In each instance the trouble was considered a "cholera break" by one or more veterinarians while one or more dissented from that opinion. These dissimilar opinions can be temporarily correlated by the statement that each individual selected was suffering from what appeared to be an acute septicemic condition and was bled in the height of the attack. Included in the experiments is the blood of 210 animals collected from nine different states. The serum and virus with which the animals had been previously vaccinated represents the products of two state and four commercial organizations.

METHOD OF PROCEDURE

The animals were bled in as sterile a manner as possible into Mason fruit-jars, the blood defibrinated and taken to the laboratory without the addition of any preservative. The blood and any tissues showing pathological changes were subjected to thorough bacteriological examination. Rabbits, mice or guinea pigs were inoculated with each sample of blood. In every instance two presumably susceptible pigs were inoculated with from five to ten cubic centimeters of the blood under examination. In every case the susceptibility of inoculated pigs, which did not sicken, was proved by the subsequent injection of two cubic centimeters of known virulent virus. In some instances the animals were inoculated with filtered blood but in the majority of cases whole blood was used. Although not shown in these protocols it was interesting to note that there was practically no variation in the results obtained by filtered or whole blood. Whenever filtered blood was used one pig was injected with filtered and the other with whole blood. In every case where the individual receiving whole blood developed cholera, the one which received filtered blood sickened equally as promptly and vice versa.

The two pigs which were inoculated with a given sample of blood were confined in separate, isolated colony-houses throughout the test period, which ranged from eight to ten days. It might be felt that animals inoculated with this blood should have been retained for a longer period. The objections to such procedure are manifold and are offset by the fact that in every instance individuals which did not sicken were inoculated with virus of known virulence and unless they remained healthy for

four days after the virus injection they were considered sick when injected.

PROTOCOL 1—RESULTS OF INOCULATING SUSCEPTIBLE PIGS WITH BLOOD FROM SICK SWINE
VACCINATED 4 TO 30 DAYS PREVIOUSLY

Number of blood samples tested	152
Number in which no virus could be demonstrated.....	122
Number in which virus was demonstrated.....	30
Negative to cholera.....	80.3%
Positive to cholera.....	19.7%

Petechiation of various organs was marked in all animals whose blood was used in these experiments.

The susceptibility of all animals which did not sicken was proved by subsequent inoculations with hog cholera virus of known virulence.

Not included in the above were three cases from cholera-susceptible herds—all proved positive.

Protocol 1 shows a summary of the results following the inoculation of susceptible pigs in the manner described above with the blood from 152 animals which sickened at varying times within thirty days after vaccination. It is therefore indicative of what may be expected in so-called "serum breaks". The detailed charts of the individual tests have purposely been omitted, since they are too voluminous for a presentation of this kind.

It will be observed that of 152 samples tested it was impossible to demonstrate virus in 122 or 80.3 percent, whereas, 19.7 percent were positive. The autopsy findings of the suspected animals whose blood was used proved most interesting. Seventy-one per cent of the thirty animals whose blood contained virus showed chronic lesions either of the respiratory or intestinal tract, in addition to the petechiae which characterized all cases. The chronicity of the lesions was such to indicate latent infection and tissue involvement at the time of vaccination and it seems probable that "vaccination cholera" resulted on account of virus being superimposed upon a previously existing, though unobserved, infection. On the other hand, since fifty-one per cent of the negative cases showed a similar condition, it seems reasonable to assume that when the simultaneous treatment is administered to animals infested with parasites or having a latent bacterial infection, that post-vaccination sickness is quite certain to occur. The resulting sickness apparently may be "vaccination cholera" in symbiosis with intense bacterial activity, or the blood may be virus-free, yet the animals present the symptoms and lesions of an acute septicemia.

Protocol 2 shows a summary of the results following the inoculation of susceptible pigs with the blood of animals which sickened more than thirty days subsequent to vaccination. These

animals, as did those in the previous experiments, all showed an acute septicemic condition, while on autopsy petechiae of the various organs was the predominating lesion. These cases may then be likened to so-called "virus breaks". The percentage which proved to be affected with cholera is somewhat higher than in the case of the animals which had been vaccinated less than thirty days. It is felt that a portion of this higher percentage cannot be explained but that some can be attributed to expired immunity, due to the vaccination of young pigs and to the use of insufficient amounts of virus at the time of vaccination. It should be noted, however, that the cases which proved not to be cholera are more than double those in which virus was demonstrated.

PROTOCOL 2—RESULTS OF INOCULATING SUSCEPTIBLE PIGS WITH BLOOD FROM SICK SWINE
VACCINATED MORE THAN 30 DAYS PREVIOUSLY

Number of blood samples tested.....	48
Number in which no virus could be demonstrated.....	33
Number in which virus was demonstrated.....	15
Negative to cholera.....	68.8%
Positive to cholera.....	31.2%

The susceptibility of all animals which did not sicken was proved by subsequent inoculations with hog cholera virus of known virulence.

Petechiation on autopsy was marked in all animals whose blood was used in these experiments. Not included in the above were seven positive cases where the animals were vaccinated when weighing less than forty pounds.

It is interesting to note that there was examined, but not included in the figures in Protocol 2, blood from seven herds where admission was made that the pigs were vaccinated as babies. One hundred per cent of these were positive, indicating the practical uncertainty of lengthy immunity following the vaccination of baby pigs.

Protocol 3 includes the same animals as those shown in Protocol 1 and indicates the day after vaccination on which sickness first became apparent. We were considerably surprised to find that the blood of some of these animals was virus-free in from four to seven days after vaccination. On account of the experiments of other investigators it was expected, regardless of the cause of sickness, that a positive reaction would be obtained in all cases where blood was drawn in four to seven days after vaccination. We have not had an opportunity to follow this lead, but feel that much information might be gained by keeping such animals under observation to determine later whether neutralization or destruction of the virus at such an early date might not result in their failure to develop substantial subsequent immunity. If such proved to be the case, there would be apparent

another potent explanation for "virus breaks", the cause of which so frequently remains in obscurity. The appreciable increase of positive reactions in the blood of animals which sickened from twenty-one to thirty days after vaccination will be noted. It is believed that this is incidental and that the results in this or any of the other groups might be reversed if a like number of samples were tested again. Stated differently, we believe that our records indicate that cholera virus is absent in many post-vaccination trouble cases regardless of the time that those cases occur, but there is nothing to indicate that such negative cases are likely to be encountered in greater proportion at any particular time after the animals have been vaccinated. The outstanding feature of the experiments quoted is the large percentage of cases where the filterable virus was absent in the blood of animals sick with acute, febrile conditions which some diagnosed as "cholera breaks" and which were characterized by petechiation. We feel certain that this will not be construed as indicating that true breaks do not occur. Our experiments indicate conclusively that this unfortunate condition does occur but that in many post-vaccination trouble cases the factor to be reckoned with is not the filterable virus, even though the virus used may have been the devitalizing factor which activated some other condition.

The point has been raised that swine may be affected with

PROTOCOL 3—(SAME ANIMALS AS THOSE IN PROTOCOL 1) SHOWS DAYS AFTER VACCINATION ON WHICH SICKNESS WAS EVIDENT, WITH NUMBER OF CASES NEGATIVE AND POSITIVE TO CHOLERA

Day After Vaccination on Which Sample Was Collected for Inoculation	Number of Samples	Negative to Cholera	Positive to Cholera	Percentage of Negative Cases
4th	3	3	0	100.0
5th	5	3	2	60.0
6th	7	3	4	42.8
7th	13	10	3	76.1
8th to 12th	46	38	8	82.6
13th to 16th	27	25	2	92.5
17th to 20th	28	26	2	92.8
21st to 30th	23	14	9	60.8

cholera while their blood is free from the virus of that disease. We question the ability of anyone to prove such an assertion by any published data. Carriers of the disease cholera have never been demonstrated, although chronically affected animals following partial recovery from acute hog cholera have been

suspected of acting in that capacity. Be that as it may, it is inconceivable that in 122 out of 152 cases the blood of cholera-sick swine would be virus-free. This opinion is strengthened by the fact that only acutely sick animals were used and that their blood was drawn on the day that symptoms were first observed or on the succeeding day. Producers of virus are aware that the most virulent virus is obtained by bleeding cholera-sick swine as soon as possible after the appearance of symptoms, provided the symptoms are accompanied by a rise in temperature. According to present knowledge the blood from all of these cases should be exceedingly virulent if we were dealing with hog cholera.

PROTOCOL 4—BACTERIOLOGICAL FINDINGS

	Strep- tococcus	Staph- ylococcus	Bact. Coli	Bact. Paraty- phosum B.	Past. Suiseptica	Ps. Pyo- cyaneus	Sterile
Blood	11	14	20	24	25	5	41
Lungs	6	2	14	29	52	—	37
Liver	2	—	7	14	8	—	109
Spleen	3	—	4	30	18	—	85
Kidney	1	1	6	11	6	—	115
Glands	2	—	—	16	19	—	103

The question naturally arises as to the cause of the post-vaccination trouble cases where cholera virus was not present. Apparently it will require a tremendous amount of experimental work to determine this point. Naturally enough our efforts first turned to bacteriological studies of the affected animals in an effort to determine the possible presence of pathogenic bacteria or their products. Protocol 4 shows the bacteriological findings in 140 cases in which virus could not be demonstrated. The cases from which *Past. suiseptica* and *Bact. paratyphosum B.* were isolated presented a clinical syndrome which was in keeping with the bacteriological findings. However, in several cases where the clinical picture was equally as suggestive of hemorrhagic septicemia, bacteriological studies failed to reveal any significant bacteria. The large proportion of cases in which it was impossible to demonstrate the presence of any bacteria which might be of etiological significance is impressive. Notwithstanding these results it is felt that before bacterial activity as a cause of post-vaccination trouble cases is relegated to obscurity, that considerably more investigational work is required. It is felt that the condition may not be unlike that

observed in such septicemias of the human as typhoid, where the condition is definitely known to be due to bacterial activity, yet where great difficulty is encountered in isolating the causative organism from the blood stream. At the present time it would appear that some factors other than cholera or bacteriemias play an important part in post-vaccination trouble cases.

While pursuing these investigations it naturally seemed advisable to determine the degree of culpability which should be attached to the serum and virus which was used in vaccinating the animals. It was felt that if the trouble subsequent to vaccination was due to impotence on the part of the products used, this fact could be detected by determining similar cases in other herds in which the same serial lots had been used. With this object in view the records following the use of one hundred million cubic centimeters of serum and six million cubic centimeters of virus were carefully studied. Of the one thousand lots of serum and three hundred lots of virus studied it was found that no trouble of any kind followed the use of over ninety-three per cent. Of the seven per cent remaining not more than two instances of trouble of any kind were recorded against any given lot and in the vast majority such experiences were limited to one herd. Upon investigation the majority, but not all, of these cases proved not to be cholera as is shown in Protocols 1 and 2. It was found that the average lot of serum and virus was used in eighty-four herds and it seems reasonable to assume that if the trouble in one herd was due to any impotence of the products that similar sickness would certainly have resulted in some of the remaining eighty-three herds.

SERUM AND VIRUS RARELY AT FAULT

Although this survey indicated remarkable efficiency on the part of the products used it was decided to investigate still further. In several instances permission was obtained to test the supposed immunity of animals in other herds which had been vaccinated with the same serum or virus used in herds where trouble had occurred and a "break" had been diagnosed. Wherever possible herds which had been vaccinated by the same veterinarian were selected. In several instances the two herds had been vaccinated on the same day, while in a few instances the owner of the two herds was the same but the animals located on different farms. In these cases the animals to be tested were injected with ten cubic centimeters of known virulent virus and

held under observation for two weeks. The immunity of eighteen herds has been tested in this manner and in no instance were susceptible animals discovered. The immunity of other herds was tested by subjecting to hyperimmunization the animals to be tested. Again no susceptible animals were discovered in thirty-six herds so tested.

The obvious conclusion to be drawn from this survey is that in the particular cases investigated the cholera breaks which occurred were not the result of inability on the part of the products to accomplish their purpose, but that the desired results failed of accomplishment because some undetermined factor unbalanced the normal relationship between host and antigen.

SUMMARY

Animal inoculation tests were conducted upon the blood of one hundred and fifty-two animals which had been vaccinated against hog cholera from four to thirty days previously and which were sick with what was supposed to be a "serum break".

The blood of forty-eight similarly affected animals which had been vaccinated for more than forty days was tested in like manner. These animals simulated a "virus break".

Confirmation of the belief that true serum and virus breaks do follow vaccination is offered in this report. However, since 80.3 per cent of the suspected "serum breaks" and 68.8 per cent of the suspected "virus breaks" proved to be some condition other than cholera it seems reasonable to conclude that a large percentage of post-vaccination trouble cases are not cholera.

Petechiation of various organs was the outstanding, post-mortem lesion of all affected animals, thus proving the oft repeated claim that this pathological change does not justify a diagnosis of cholera. Bacteriological studies of the affected individuals failed to divulge as much information as was hoped for. In some cases the clinical syndrome of hemorrhagic septicemia and paratyphoid fever was substantiated by the bacteriological findings, but on the contrary the bacteriological findings of the majority of the cases studied was negative and justifies the conclusion that some post-vaccination trouble cases are due to factors other than hog cholera or bacteriemias.

Our examination of blood from animals which sickened subsequent to vaccination revealed the fact that 19.7 per cent and 31.2 percent respectively were affected with cholera. The same serial lots of serum and virus used in vaccinating the affected

animals were used in eighty-two or eighty-three other herds without any undesirable results. It seems only reasonable, therefore, to conclude that the true "cholera breaks" which did occur were due not to the products used but to principles of immunology not yet appreciated or to technical details of administration which are recognized potent causes of post-vaccination trouble.

There is apparent an urgent need for studies to ascertain the immunological factors which determine the immunity of some individuals and the susceptibility of others following vaccination. In this respect our problem is not unlike that of the physician, who is unable to immunize approximately ten per cent of the children vaccinated against diphtheria by the toxin-antitoxin mixture, or a similar percentage against small pox, although the ninety per cent vaccinated with the same products do become immune. Pending the determination of these factors there should emanate the knowledge that a certain percentage of swine properly vaccinated with potent products fail to become immune to cholera.

DISCUSSION

DR. J. W. BENNER: Mr. Chairman, I have been very much interested in the paper as presented by Dr. Cahill. Some very interesting work has been described, and in a very complete way. We have not had much of this post-vaccination trouble in our swine practice around Ithaca, New York, but I have been in sections of the country where there has been a great deal of it.

I remember in the earlier days of the hog cholera serum work in Kansas, when practitioners were reporting a great deal of this kind of trouble, and of course the question that naturally presented itself was how to overcome it. This question, as such questions usually are, was directed to the Veterinary College, at Manhattan, Kansas, and the advice that seemed to do the most good was to increase the dose of serum. I know by the experience of field men in hog cholera work, and also of practitioners, that in those earlier days of the work, as soon as they began to give the larger doses of serum post-vaccination troubles were not so frequent. This is just one of the conditions that seem to cause post-vaccination troubles. There are, no doubt, a good many other factors that may enter into it.

On this same point, the increase of the doses of serum, as worked out in the cases I have just mentioned, brings to my mind a certain phenomenon that we noticed in connection with our work on hemorrhagic septicemia in swine. In vaccinating pigs against hemorrhagic septicemia, we found that an artificial resistance could be created by the vaccination, so that when a lethal dose of a suspension of living organisms as antigen was administered intravenously the pig would die, but the organism (*Bact. suissepticum*) could not be demonstrated in the blood; whereas, if the same dose was injected into a pig that had not been vaccinated the organism could easily be demonstrated in the blood after death. We have seen this occur in a very clear-cut, decisive way, and I think it may be an explanation for some of the cases of hemorrhagic septicemia, where typical clinical manifestations and typical lesions are observed, but where the organism cannot be found. In the experiment that Dr. Cahill has described, it seems to me that there may be a grade of immunity present in the vaccinated animals, produced by the serum that has been given, in which the serum has partially neutralized the virus, or perhaps partially destroyed it, so that it cannot be demonstrated in the

blood, even though the individual may be sick at the time such blood is drawn.

As was seen on the charts given, the higher percentage of animals in which the hog cholera virus could not be demonstrated in the blood was where sickness occurred in thirty days time. The grade of immunity from the serum given would naturally be higher at thirty days than later; that is, the passive immunity possessed by serum alone would become weaker as time went on, and I am wondering if a phenomenon similar to the one which I have described is not occurring here—if the grade of immunity in the animal is not one that is changing the virus, so it cannot be demonstrated by subsequent injection into a susceptible pig, but at the same time is causing sickness in the pig from which the blood is drawn for such examination.

These samples were in all cases taken from sick pigs, and not from dead pigs, as I understand it. This is just a point that has suggested itself to me as I have been thinking over the work which Dr. Cahill has presented. It is my belief that there is a great deal in the grade of immunity produced by serum. In administering the simultaneous treatment, we depend on the serum to protect the health and life of the animal from the virus. Therefore it is of the utmost importance that we should pay close attention to the dose and the quality of serum used in this method of hog cholera vaccination.

DR. R. P. MARSTELLER: I would like to ask Dr. Cahill if he has any data on the approximate percentage of animals in the herds that show symptoms of infection.

DR. CAHILL: That is one of the points, unfortunately, on which we are unable to get as much information as is needed. I have talked with field men in practically every State in the Union regarding such cases, and find that in the majority of such instances the herd is retreated with serum and virus before there is any opportunity to determine the percentage of animals which would really sicken.

It is our opinion that in these negative cases the proportion of animals which would sicken would be small, and that retreatment received credit for stopping a "break", when in reality few, if any, additional animals would have sickened had they not been retreated. In other words, it appears that this is an individual rather than a herd proposition. If this be the case, retreating not only makes impossible the procuring of valuable data but unnecessarily injures the standing of the simultaneous treatment.

The work Doctors Benner and Birch have done on this subject is such as to warrant a very careful consideration of any opinion which they may express. We do believe that there is a great deal in what Dr. Benner says, but the thing that we are unable to understand is why a small percentage of these individuals would lose their immunity while immunity is retained by others.

Apparently, field investigators overlook the fact that a certain percentage of individuals properly vaccinated with products which are fully potent fail to become immune to cholera. Why they exist, and how we are going to overcome the trouble is, of course, a problem.

DR. E. R. STEEL: The subject of "breaks" is very interesting to me. I agree with Dr. Cahill in many of his remarks, but there are a few things to which I might take exception. In handling serum, I buy it by the test. In that way I have an opportunity to watch it under different conditions in different herds. Then I keep a record of each herd treated. In buying virus, I try to get that in quantities of two or three thousand cubic centimeters, so that I have a record on possibly a thousand head. I have thought of checking up the virus, for that would be the real way to do, although we have to place our confidence more or less in the producer.

This summer I have had an opportunity to watch these "breaks". I started in with a serial and I got along with the serum fine, until later in the summer. We got into that period where the pigs were beginning to show secondary infections of all kinds, pneumonia and one thing or another, and then I began to have "breaks" with this same serial, just a few isolated cases along, maybe three or four pigs out of a hundred. In my own mind I know that these secondary conditions do influence the production of immunity.

On the other hand, I am not of the opinion that all lots of serum and virus

are absolutely all right, and that we can't question them on account of government inspection. I know something about serum and virus production, through engaging in it. I know there is a good deal of temptation when we have perhaps a thousand dollars worth of serum on test, to get that test by, if possible. It is also said that our test is not really a serum test; it is a pig test. It is a matter of hunting around until we find pigs that are suitable to stand the test. It is not a true test; the test must come, necessarily, in the field. Personally I would not want to be worried with vaccinating hogs under field conditions as we do now, buying two thousand cubic centimeters of one serial and fifteen hundred of another; there is too much responsibility connected with it. Just for the satisfaction I have in keeping these records myself, I would rather buy it in larger quantities.

Now, in regard to production: I have heard serum producers state that they are making serum to suit themselves, and evidently they are. I think that all serum is more or less potent, and all virus more or less virulent. But there are different degrees of potency and virulence. I think the check on that really comes in the field, that a serum company can't produce serum, on a commercial basis alone, very long without getting into trouble.

Now, the handling of serum and virus in the field is another thing. I have been in veterinarians' offices where they leave the serum sitting around where it is warm. They take it out in the field, and bring it back, and then say they have one bottle that is no good. Some pigs die, and they blame it on that one bottle. If they understood the making of the mixture, they would know that that is simply impossible. It is their care of that particular bottle more than anything else. I keep serum and virus the year round in an ice-box. I keep a thermometer in it, watch it; it stays around forty or fifty degrees. In the field I carry them in an ice-box. I have checked it with a thermometer and carry it at around fifty degrees, and I think that is very important—with virus especially. There has not been enough experimental work done on this, but virus heated to atmospheric temperature in the summer time, and taken on trips half a dozen times before it is used, will be more or less weakened in its virulence, some of it becoming absolutely inert.

When I was in production work at the University of California, we had a man who came from Honolulu and bought some serum. He had to produce his own virus. He told me he couldn't keep virus alive two weeks, under the conditions which he had for producing it. The sanitary conditions entered into it. The virus that is contaminated and not produced in the cleanest manner, I think will weaken in a very short time. There are a good many factors like that which will have to be taken into consideration.

Pigs have enteritis, worms, isolated cases of pneumonia, and we have to take these things into consideration, or we will have trouble. As Dr. Benner said, we can overcome these by increasing the dose of serum, not in the sick pig alone, but in all the pigs in a herd, even to the well pigs, because they may have some of the lesions that we don't recognize from physical appearances.

I am inclined to agree with Dr. Benner, as regards the possible effect of serum on the hogs which you tested out. I have sent in some blood samples from hogs that I thought had distinct "breaks", and we were not able to reproduce the disease from those blood samples, and it might be that the virus would be affected from the serum that was given simultaneously, although the pig would sicken, I think, not due so much to the virus itself as to secondary conditions influenced by lowered vitality, the result of the reaction to the virus.

Now, one of the complications that we are having in the immunization of pigs in the field in Iowa is hog "flu". I confess I don't know anything about it. Still I have been bothered with it just the last two or three weeks. I had a very distinct outbreak of a disease in which the symptoms and history all pointed to typical hog cholera. The pigs would stand around with noses down and the curl out of their tails and refuse feed and die, show no symptoms of cough or thumps or diarrhea or any evidence of any other secondary condition. In another neighborhood they had this complicated condition of pigs sickening with thumps and cough. They all thumped and you would have said that it was typical hog "flu." What were we going to do? I have

been immunizing hogs against cholera under those conditions, even if they did show symptoms of "flu," by increasing the dose of serum one-half. My opinion is that if we have a good, potent serum we can overcome the effect of the virus by increasing the dose of the serum.

Now, I have kept a record on some four thousand hogs treated, all of which appeared to have "flu," without a loss of more than two per cent. A good many believe that can't be done. I used five cubic centimeters of virus on them. I like to use plenty of virus (these were heavy hogs), to make sure they get it. I have done that for three years. This last year we didn't have any cholera mixed with the "flu"; some got by without vaccinating. This year we are getting the "flu" and cholera all mixed up. The only thing I can advise is to go ahead and vaccinate, if there is any danger of cholera at all. (Applause.)

CHAIRMAN KINGMAN: Does anyone else wish to discuss this paper?

DR. BENNER: There is a little experience that I have had once or twice that I would like to ask others about; that is, in giving intra-axillary injections in pigs. Once in a great while I have one that dies rather quickly, in three or four to twelve hours.

I have suspected that the cause for this was rough handling. But I have also thought that it might be injury to some nerve in the axillary space. One was in a shoat of about fifty or sixty pounds. The owner had considerable trouble in catching him; I gave him the intra-axillary injection. When we turned him loose he was breathing hard, and was not able to get around very well. Before I left the place he was dead.

Another case that I had just last month was one where I vaccinated some shoats and there were two dead the next morning. I have vaccinated any number of hogs with the same serum and virus, and did not have any trouble at all.

I just wanted to ask whether anyone has had the same experience.

BUREAU VETERINARIANS TRANSFERRED

Dr. W. LeRoy Williamson (O. S. U. '15) of the meat inspection service at Chicago, has been transferred to the same line of work at Ottumwa, Iowa, Dr. Oliver T. Burton succeeding Dr. Williamson at Chicago, from a previous assignment at Ottumwa.

Dr. M. J. Kemen was transferred from hog cholera control work, in Mississippi, to meat inspection at Chicago, Illinois, effective July 23. Dr. Kemen has since severed his connection with the Bureau.

Dr. Lynn H. Mead (Corn. '14) has been transferred from meat inspection, at Madison, Wisconsin, to the same service at Chicago, Illinois. Dr. Daniel F. McCarthy (K. C. V. C. '18) has been transferred from a field position, in Arkansas, to meat inspection service at Chicago. Dr. Lenly T. Hopkins (Chi. '18) has been transferred from the meat inspection service, at Chicago, to the Meat Inspection Division at Washington.

Dr. John M. Young was transferred on August 16, from New York City to Brooklyn, N. Y., in the meat inspection service. Dr. Albert M. Meade has been transferred from tuberculosis eradication work, in Georgia, to a similar assignment in Nebraska.

EXCESSIVE PIG LOSSES CAN BE PREVENTED¹

By A. T. KINSLEY, Kansas City, Mo.

The live stock industry is the principal agricultural asset of the nations of North America. The success of live stock production by the American farmer must, at least in part, be attributed to the efficient control of diseases of animals. The annual toll of animal scourges has been diminished, but little has been accomplished in reducing infant mortality of farm animals. The loss of young animals in general, and pigs in particular, is enormous and it is evident that the future success of our animal industry is dependent upon lessening those losses.

Swine are produced on the majority of farms in America and represent one-tenth of the value of the agricultural products of the United States. Swine are the most economical farm animals for converting raw materials into meat food-products. The basic law of supply and demand ultimately regulates the production of necessary commodities and the constantly increasing population will result in an increased demand for pork products. Increased demands will necessitate a more intensive swine production and a tendency to overcrowding, conditions that favor an increased mortality, not only of infant pigs, but also of shoats and mature hogs. The principal losses of swine, numerically speaking, occur from the time of farrowing until the pigs are one month of age. The average breeder matures about fifty per cent of the pigs farrowed.

According to reports, there was over ten per cent more brood sows on farms in the United States in the spring of 1922 than 1921, but there was only an eight per cent increase in swine during that same period. The average number of pigs farrowed is nine plus. Sows should produce two litters each year. The average number of pigs saved per litter of the 1923 spring farrow was 5.02 according to a limited pig survey conducted by rural mail carriers for the United States Department of Agriculture. If extensive statistics were obtained, it is very probable that the average pig production per sow each year would be found to be less than nine.

Assuming that eight pigs is the average production per sow each year, then 7,500,000 sows are necessary to produce 60,000,000

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

swine. If production efficiency were increased to eighty per cent the average production per sow each year would be fourteen pigs and it would require only 4,285,700 sows to produce 60,000,000 swine. That is, by increasing the production efficiency from fifty per cent to eighty per cent, the same number of pigs could be produced by sixty per cent of the sows that are now required. It would, therefore, be more economical to increase the production efficiency than to increase the number of brood sows.

The mortality of infant pigs* is primarily due to improper swine management. This loss can be diminished by correcting the breeding methods, regulation of the feed, proper housing and providing sanitary quarters. It is true that the various factors conducive to infant-pig mortality are under the direct supervision of the swine producer. It is equally true that excessive losses of live stock, from disease or conditions that are preventable, are indicative of an incomplete veterinary service. The problems of swine management are numerous and only the most important factors will be considered.

SUGGESTIONS ON BREEDING AND FEEDING PROBLEMS

The boar is fifty per cent of the breeding herd. It is economical to use pure-bred boars for the breeding of market hogs. Boars should be kept separate, in a small pasture, during the summer months. The winter care should include proper housing with ample bedding and a maintenance ration. A common mistake of breeders is that of keeping the herd boar too fat. The boar should be given a maintenance ration during the non-breeding season. From two weeks to a month prior to the breeding season a ration of ground oats, barley, or mill-run feed, and skim milk or milk, should be provided. When possible, green foods should be supplemented, and in the big-type hogs it is advisable to supply extra quantities of minerals.

Gilts for breeding purposes should be selected from families that are good milkers and prolific. They should have ten or twelve well developed teats. Breeding gilts should be provided with a growing ration. They should not be fattened. For two months after breeding, the sow can be fed a ration containing a limited quantity of fat-forming elements, but they should be given a narrow ration during the last two months of gestation and the ration diminished from thirty to fifty per cent one week prior to farrowing. The sow should be provided with water but no food for one to two days after farrowing. The ration

should be limited until the pigs are about ten days of age after which it should be gradually increased, reaching the maximum when the pigs are about three weeks of age.

The proper age for mating swine is a question of considerable importance. From general observation it would appear that mature animals of about the same age generally produce the best results. It is said that there may be some difficulties, particularly in farrowing, when young sows are mated with aged boars. Aged sows may be bred to young boars, although some breeders contend that a mature boar produces stronger pigs and a larger litter. Another important question confronting the breeder is the length of time that sows or boars can be profitably kept for breeding purposes. According to the results of most breeders, it would appear that sows are profitable breeders for about five years, during which time they should produce two litters annually or ten litters in all. The length of time that a boar can be maintained as a profitable breeder will depend upon the proper selection of sows to avoid the disadvantages of intensive inbreeding. Boars that have been properly cared for and used are usually serviceable for at least five years.

Gilts should not be bred until they are practically mature. The large-type swine do not become mature until they are at least one year of age and these swine should not be bred until they are ten or eleven months of age. Smaller type swine mature at an earlier age and can be successfully bred when they are about six or seven months of age. The age at which a boar can be put into service varies according to breed. In large-type swine the boars should not do general service until they are one year of age and even at that age the service should be restricted. Boars of the smaller-type breeds can be put to limited service when they are six months of age.

PASTURE BREEDING UNDESIRABLE

One of the contributing factors in the production of small litters and excessive loss of recently farrowed pigs has been pasture breeding. It is not infrequent for a boar running with sows to make ten or fifteen services in a single day. A single service is sufficient for the breeding of healthy animals and if animals are not healthy they should not be used for breeding purposes.

Infection of the uterus of the sow is relatively common and is an important factor in the loss of pigs. The results of uterine

infection depend upon the virulence of the infection and the resistance of the sow. Infections with microbes of high virulence in a sow of low resistance may result in abortion but when some are infected with microbes of low virulence they will probably not abort, but will produce pigs of low vitality and possibly one or more runts. Pigs farrowed by sows with uterine infection are probably infected at the time of farrowing.

A small pen should be provided for the boar into which the sow can be driven for breeding purposes, unless a crate is available. When the boar has made one good service, the sow should be removed. It is true that individual-service breeding requires some time, but it will increase the pig production.

HOUSING

Proper shelter should be provided, for nature did not provide swine with a coat of hair or wool to protect them against extreme weather conditions. During March and April, 1923, several hundred thousand pigs died as a result of exposure, in the central states. Permanent hog-houses are not in favor with many of the leading swine producers because of the impossibility of efficient disinfection and the difficulty of rotation of lots. Temporary sheds and farrowing houses that can be moved from place to place are preferable. Damp, musty pens and houses, and improperly ventilated hog-houses favor the maintenance of various germs and are conducive to the life of animal parasites, thus further endangering the life of the recently farrowed pig.

The following is a brief summary of some of the conditions and diseases of pigs induced by improper management.

PYEMIC ARTHRITIS

Pyemic arthritis is a disease condition affecting recently farrowed pigs. This disease is characterized by inflammation of the umbilical tissue and suppurative arthritis. It is widespread and usually occurs as an enzootic. Pyemic arthritis is due to infection which may occur *in utero* or after farrowing. The disease is, in the majority of cases, manifest within ten days after farrowing. The symptoms consist of lameness, swollen, sensitive joints, diminished appetite and usually diarrhea. The young affected pigs usually have a diminished vitality and die within one or two days after the onset. The diagnosis can be verified by the post-mortem findings which consist of omphalitis, suppurative arthritis and there may be metastatic abscesses.

The treatment of pigs affected with pyemic arthritis is not satisfactory as a rule. This disease can be prevented by breeding healthy animals only, and by providing sanitary quarters.

PIG SCOUR

Scour in pigs is relatively common. Several million pigs die each year as a result of scour. Many swine breeders have lost ten to twenty-five per cent of their pig crop, for several successive years, from pig scour. This is essentially a disease of early life. Many theories have been advanced as to the cause of pig scour, and when all theories and evidence are carefully considered it appears that this condition in suckling pigs may be of dietary origin or infectious. The principal cause of scour in pigs, that are not infected *in utero*, is improper diet of the sow. No doubt, infection with various microbial agents, especially the representatives of the colon-typhoid group, is an important secondary cause of scour in pigs.

The principal symptom of pig scour consists of diarrhea. The discharges in the beginning are of a pasty consistency and of a gray or slate color. Later in the disease the discharges become watery and have a disagreeable odor. The tail and hind parts of the affected pig become soiled. The appetite is variable. Usually there are colicky pains and an appearance of dejection.

Medicinal treatment is of little avail because affected pigs have a low vitality. The disease can be prevented by breeding healthy sows and by proper feeding. Pregnant sows should be placed in individual farrowing lots or pens at least one week prior to farrowing and they should be given partial diet of ground oats, barley or mill feed. All feed should be withheld for at least twenty-four hours after farrowing and then a restricted diet provided, until ten days after farrowing, when the feed can be increased until a maximum production of milk is produced. By regulating the feed as above outlined, the mammary secretion is restricted and the pigs will not be gorged with excessive quantities of milk.

BULL-NOSE

Bull-nose (infectious rhinitis) is probably a specific infectious disease of pigs, characterized by inflammation of the mucous membrane of the nasal channel and related sinuses and by involvement and deformity of the facial bones. Bull-nose is rather prevalent and although not very fatal is responsible for the failure of development in affected individuals. Pigs that are.

kept in filthy pens and improperly ventilated hog houses are predisposed to bull-nose. It is possible that the *B. pyocyaneus* is the specific cause of this condition. The symptoms manifested in bull-nose consist of sneezing and a watery discharge from the eyes and nose, which later becomes purulent. Affected swine have a tendency to root, and although they may eat heartily they do not gain in weight. In the latter stages there will be bulging of the facial bones. This lesion is usually associated with a peculiar blowing noise. Bull-nose can be readily and effectively prevented by providing sanitary quarters and by the proper selection of breeding animals.

SORE MOUTH

Sore mouth (stomatitis) is a very common condition in pigs and is responsible for the loss of a great many small pigs each year. This condition primarily occurs in swine in filthy pens or in those that are improperly housed and are not given the proper rations. It especially occurs in pigs of large litters, probably because of under-nourishment. Various microbial agents have been identified as possible causative factors of stomatitis. The *B. necrophorus* produces a distinct type of the disease ordinarily designated as necrotic stomatitis. The symptoms of stomatitis consist of depression, listlessness, the affected pigs have a tendency to remain quiet, and there may or may not be diarrhea. If the affected pigs are examined, lesions of various dimensions will be found in the mucous membrane of the mouth.

Stomatitis in pigs can be prevented by proper management of the breeding herd. This condition can be controlled by curetting the lesions of the mouth and applying some reliable antiseptic. When the disease has once made its appearance upon a farm, each pig should be carefully examined each day to determine whether or not any lesions exist and all affected pigs should be treated, as above described, daily.

GOITRE

There have been some losses of pigs due to goitre. These losses have occurred particularly in the northern section of the United States and Canada. The cause of goitre appears to be a deficiency of iodine or iodine salts in the food. The affected pigs show an enlargement in the throat region at the time of farrowing. In many instances, the affected pigs have no hair and are dead at the time of farrowing. This condition can be prevented

by administering iodine or iodine salts to sows during the period of gestation.

RICKETS

Rickets is essentially a disease of malnutrition. It is probably a condition resulting from the lack of vitamins, calcium salts or the absence of sunshine. It occurs in the development of the pigs and is manifested by digestive derangement, associated with disturbance of locomotion. Rickets frequently affects all the pigs in a litter and it may affect all the pigs on the same farm. Rickets is a preventable disease. The disease is rarely observed in herds that are properly housed and fed. This condition is usually quite effectively corrected by proper feeding and the administration of lime salts in conjunction with cod-liver oil.

ASCARIDOSIS

Pulmonary ascaridosis is another very important disease of little pigs. The loss incidental to the larval form of the ascarid occurs in pigs from ten to thirty days of age. Infestation of pigs over thirty days of age with the ascarid larvae rarely results fatally, although it will diminish the vitality of the infested pigs and they will not develop properly. Suffice it to say at this time that pulmonary ascaridosis is a disease that is easily controlled. The essential feature in controlling this condition consists of rotation of pasture and hog lots, thorough cleaning of brood sows and hog-houses, and the proper administration of efficient vermifuges to expel the adult ascarid. On farms in which the above is carried out the losses due to pulmonary ascarids have been reduced to a minimum.

SUMMARY

There will be a constantly increasing demand for pork products. An increased swine production can be accomplished most economically by diminishing infant mortality in pigs. The prevention of infant mortality of farm animals is one of the important problems, the solution of which depends upon the inauguration of twentieth-century farm hygiene and sanitation.

DISCUSSION

DR. I. K. ATHERTON: Mr. Chairman, Dr. Kinsley has sounded a note of warning to which attention should be paid. Last spring in Maryland I was asked to make an estimate on the swine losses. We made a survey of 120 farms, covering the 23 counties in the State, and I turned in an estimate of a loss of baby pigs amounting to 390,000. It sounded so large that the Chief of the Hog Cholera Division did not want to turn it in. He wanted to know how many hogs we had on farms January 1, 1923. Statistics showed 300,000. Yet the losses of young pigs, at a low estimate, would have been above 350,000.

DR. C. W. FOGLE: Dr. Kinsley made several references to oats, barley and mill feeds. I would like to call the attention of the gentlemen who are here, to the fact that alfalfa hay, either whole, chopped or ground, spread over many years, is a much more economical feed for swine than oats, barley or mill feed.

You men who are familiar with the yield of barley per acre know that it is an expensive crop to raise. This particular year wheat is worth about \$0 or 90 cents a bushel, which makes ground whole wheat worth about \$1.50 per hundred, and mill feeds are worth around \$2.00 per hundred, retail, where the wheat is produced. Oats is always rather an expensive feed for hogs. Ground alfalfa hay to a very great extent takes the place of it, and the feeding value of a good quality of alfalfa is higher per one hundred pounds than a poor quality of oats, although the oats always sells at a higher price per ton than alfalfa.

DR. E. A. CAHILL: Mr. Chairman, Dr. Kinsley very modestly called his talk elementary or "high school" stuff. I just hope it will be widely published and made accessible to all the men who are engaged in swine practice. It seems to me if we would better appreciate some of these fundamental problems dealing with housing and feeding, we would have a great deal less discussion and acrimonious feeling as to whether animals are suffering with hemorrhagic septicemia or something else.

It is becoming more and more apparent, in the West particularly, that a great deal of the trouble in younger pigs and a great deal of the trouble in older pigs is due to the very factors that Dr. Kinsley has pointed out.

DR. J. I. GIBSON: Mr. Chairman, I enjoyed Dr. Kinsley's paper very much. I feel a peculiar interest in his reference to the ascaris infection, as I am carrying in my work the Government film "Exit Ascaris" and showing it at all my farmers' meetings. Personally, I believe this roundworm is causing as great losses in the swine industry as any other disease or infection, and the farmers are beginning to believe it. You know it takes some time to convince a farmer of anything.

I think the prevention of the roundworm in hogs will put more money into the pocket of the swine grower than any other one method of prevention. It is a known fact that in McLean County, Illinois, with twenty-two herds in this experiment and in some of the herds over 1,000 pigs, there was not one runt in the twenty-two herds.

If you can convince the farmers, the swine growers, that they can change all their runt pigs into first-class pigs, they will follow you—and I firmly believe this can be done. There is one farmer near Maryville, Missouri, who has 100 shoats that he has cared for in this way, and every swine grower and every man from the St. Joseph market engaged in the commission business, who has seen Mr. Roy Lipman's shoats, says he never saw a herd of shoats equal to them.

The farmer following this ascaris prevention can place his shoats on the market at six months of age as good in weight as he has been putting them there at nine or ten months, and the six-months pig, that weighs two and a quarter, will bring a higher price than the nine- or ten-months pig that weighs two and a quarter, because it is a better pig; it is what the packer is looking for today.

I feel that one of the greatest things that the practicing veterinarian can do for his clientele is to coach them in so raising their pigs that they will be free from the ascaris worm.

You all know that the colony-house has come into favor; for a number of years it has been looked upon as the proper thing. What virtue is there in the colony-house? The main virtue is that the colony-house has been placed on cleaner ground. Boys' and girls' pig clubs have been given great credit for producing pigs so much better than those that their dads produced. Why? Because the club sow and her litter were placed on cleaner ground. In my preaching on this subject I advocate to the farmer a clean life for the pig, and I tell him that a young pig is a baby pig; he must get it in his mind that a pig and a hog are entirely different. The pig must be protected while young.

The clean life will do away with practically all the troubles that are experienced in the growing of pigs today—the “bull-nose,” the sore faces and sore mouths, the necrotic, sloughing skin areas, the necrotic enteritis and the “mixed infection” will all be overcome, if you will give the pig a clean life and make a field animal of it instead of giving it a low-down, mud-hole habitation.

I don't think there is anything better that the profession can do today, for the live stock industry, than coach our clients in the protection of their pigs by giving them the clean life. Have them walking on the green; wherever they go, have something green under their feet—and of all the green things I believe alfalfa is the best. (Applause).

CONVENTION NOTES

Dr. and Mrs. L. H. Wright drove to the meeting from Columbus, Wis.

Des Moines will repeat in 1924, after an interval of twenty-nine years between meetings.

Dr. A. D. Goldhaft, with his family, drove from Vineland N. J., to Montreal, a distance of 583 miles.

The oldest vice-president in attendance was Dr. L. H. Howard, who served the Association in this capacity in 1882.

Dr. W. F. Crewe, State Veterinarian of North Dakota, although a member of the A. V. M. A. for thirty years, attended his first meeting this year by going to Montreal.

Among those who motored to Montreal were Dr. and Mrs. C. J. Marshall, of Philadelphia, and Dr. and Mrs. J. H. McNeil, of Trenton, N. J. They report a very successful and enjoyable trip.

Among those who stopped off in Detroit, long enough to pay a visit to the Association offices, were Dr. J. H. McLeod, of Charles City, Iowa; Dr. A. T. Kinsley and Dr. A. Trickett, both of Kansas City, Mo.

Dr. W. F. Hodam, of Le Mars, Iowa, had things all his own way in the matter of long-distance honors for driving to Montreal. It took him just a week to cover the 1707 miles in his trusty Ford. He was accompanied by Dr. P. L. Ellis, of Merrill, Iowa.

Among the notable visitors who attended the convention was Mr. James E. Bartlett, of Indianapolis, president of Pitman-Moore Company. It was the first time that Mr. Bartlett had attended an A. V. M. A. convention since the big meeting in Detroit, in 1916.

PRACTICAL OBSERVATIONS ON CERTAIN DISEASES OF THE DOG AND OTHER LABORATORY ANIMALS¹

JOHN G. HARDENBERGH, V. M. D.

*Division of Experimental Surgery and Pathology,
Mayo Foundation, Rochester, Minnesota.*

During the last two and one-half years I have observed several thousands of laboratory animals, including dogs, cats, rabbits, guinea pigs, white mice and other species, under constant conditions of housing, feeding and general care. Particular attention has been paid to the dog. Although the majority of these animals never gave evidence of natural pathologic processes, there has been a certain incidence of disease which has permitted the collection of interesting data. More guinea pigs and rabbits than dogs have been handled, but the diseases they present have been less important from scientific and economic viewpoints, and, judging from the small numbers of such animals brought to the free dispensaries and hospitals of our veterinary schools, they form a negligible factor in the practice of veterinary medicine. However, there are a few principles of general care and a few diseases of the smaller animals that it may be worth while to consider briefly, because the raising of pet stock for sale as pets, or for laboratory use, is becoming increasingly prevalent, and the veterinarian may be called on occasionally for advice concerning them.

Some of the conditions under which our observations of disease have been made may differ in a few non-essential respects from those met with in general practice, but so far as the diseases themselves are concerned, they are, of course, identical. In private practice, each new case is a new problem requiring individual solution. Although every veterinarian has certain methods of treatment for certain conditions, yet, if he is to do justice to his client and to himself, he must make a separate study of each case and meet its own particular requirements. On the other hand, when several hundreds of animals are constantly in one's care, the problems of prevention, control and treatment of disease call for measures that are comparatively simple, efficient and routine in application, except in special instances. The observa-

¹Presented before the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

tions made as a result of these routine procedures, as we have practiced them, form the basis of this discussion and are of practical interest. Results of experimental work will be mentioned only so far as they have a direct bearing on the diseases discussed.

The chief consideration in preparing and holding animals for laboratory observation is, obviously, to maintain them in the best possible physical condition. In the case of dogs, this means giving them time and opportunity to contract distemper if they are not already immune, aiding recovery so far as possible, and then bringing them to good condition before they are turned over for laboratory use. We prefer to hold guinea pigs and rabbits, as well as dogs, for several weeks until they have become thoroughly acclimated; in the meantime any that are weak or have contracted disease during shipment will have recovered or died, and the laboratory is assured of a good supply of healthy animals accustomed to our methods of feeding and confinement. Such a system necessitates the keeping of a surplus of animals of all kinds, but it is the best and most economical system in the long run; it is much better to take losses in laboratory animals before they have been used rather than to have an experiment or a series of experiments come to naught because of the untimely death of animals at what is often a critical stage in the work, all because of improper preparation of the subjects. In addition, clean quarters, proper diet and exercise are important factors.

DISEASES OF DOGS

Distemper.—Distemper, as we see it, is about equally prevalent at all times of the year. I know of nothing new as to the primary cause; neither has a "cure" been found. It seems to have no great respect for age, because it occurs in dogs of practically all ages. I wish to emphasize that non-immune dogs contract the disease, regardless of age, either shortly after being exposed, or following etherization and surgical interference. It seems plausible that the reason distemper is not more often observed in old, non-immune dogs is because there is seldom a sufficient decrease of natural resistance or reduced vitality after such animals have reached maturity, associated with exposure to a virulent infection. Most of our dogs are city raised, and about 50 per cent are already immune.

It is believed that *Bacterium bronchisepticum* is not the real primary cause of distemper, and there is considerable data to

support this view. We have failed to produce distemper at all consistently in young susceptible animals by repeated doses of this organism given intranasally, intratracheally, intravenously or subcutaneously, and in various combinations of these methods. Yet we have seen these same animals develop typical cases several weeks or months later, when exposed to natural infection. In trying to cause canine distemper by use of *Bacterium bronchi-septicum*, we have used not only cultures freshly isolated in our laboratory, but also several strains furnished by the laboratory where this organism was first isolated and described. The organism is found in almost every case of distemper that is cultured, and frequently is isolated in pure culture from the trachea and large bronchi. However, its etiologic as well as immunologic significance have not been apparent.

The respiratory or catarrhal form of the disease is most common; it is usually accompanied by involvement of the eyes, and often by intestinal disturbance. This form almost invariably terminates in bronchopneumonia. In younger animals the pustular manifestations on the abdomen and inner thighs is often observed, but this form is seldom uncomplicated by more serious lesions.

It would seem superfluous to discuss the symptoms of distemper, because every practitioner is familiar with them.

Our method of treatment is as follows: As soon as an animal is found to be diseased, he is removed from the open pens where he has been running with a few other dogs, and placed in a cage where there is ample opportunity to eat, if he will, without interference. The diet consists of kibbled dog biscuit, bread, with whole or skimmed milk, meat occasionally, and plenty of water. The only drugs consistently used are combinations of eucalyptus, camphor, guaiacol, and others which are eliminated to some extent through the lungs. Such medication does not, I believe, reduce the mortality, but it does seem to hasten resolution and facilitate recovery in those animals that are "predestined" to survive. We have always tried to approach the various phases of distemper with an open mind, and consequently have tried almost everything that has been reliably sponsored as exerting a favorable action in the disease. As a result our medical régime has been reduced to that just outlined.

We have given every form of biologic treatment extensive and repeated trials without reducing mortality. These trials have been made with commercial products gratuitously supplied by the manufacturers, or purchased in the open market, or with

products which we have prepared ourselves. Both the commercial and domestic preparations have included bacterins and anti-sera prepared with *Bacterium bronchisepticum* alone, and also products that were polyvalent. There have been times when, if we had been contented to limit the trial of these biologic preparations to a few animals, we would have been left with the impression that we were getting good results; however, when the trials were extended to cover hundreds of animals, in one instance five hundred being used, we were forced to conclude that no appreciable good had been done.

Our records show a mortality from distemper of 28 per cent. This is probably a fairly low rate considering the type of disease most prevalent in our animals and the rather simple method of treatment, compared with that usually employed in private practice. One factor which may help to account for the low rate is the type of dog we receive. Many of them are true mongrels, and such animals are not to be surpassed in natural resistance, "toughness," and allround, never-say-die spirit. In my experience in treating pure-bred dogs, the mortality has averaged close to 75 per cent. Such animals die when least expected, and with the least evidence of resistance. These highly bred animals, with hypersensitive nervous mechanisms, are also prone to develop lesions of the nervous system, which detract greatly from the chances for recovery.

Because of the type of dog which predominates in our kennels, sequelae are not very common. We occasionally see chorea, more accurately "tic" or clonic spasms, as a sequela of distemper, and have found it impossible to cure. Whether or not this condition is a true chorea is beside the question. Certainly nine-tenths of the cases designated chorea are sequelae of distemper. The frequency of chorea in police dogs is evident from our own observations, from the experience of other men who have had considerable canine practice, and from demonstrations we have seen at small animal clinics. In some instances there is a history of distemper, and in others the owners felt quite certain that the disease had never been present. The keepers of the kennels from which the animals were first obtained also denied the previous occurrence of distemper in these cases, but this is to be expected. Nevertheless, from the fact that animals without a history of distemper failed to contract the disease later, when exposed to it, we have concluded that there had been a previous attack, either so light as to be unrecognized, or simply denied.

Of the other sequelae, eye lesions are most common. Some very obstinate cases of conjunctivitis and keratitis appear with, or follow, distemper. Deafness is occasionally noted and chronic nasal discharges are common.

External parasites.—Fleas, lice, and sarcoptic mange are the usual forms of external parasitism with which we have to deal. An occasional case of demodectic mange is seen.

Owing to our routine of handling newly received animals, and the sanitary construction of our kennels, we have little difficulty with fleas and lice. New dogs are dipped when received in a 1 per cent solution of a cresol-phenol compound, and this usually suffices to eliminate the blood sucking parasites. Thereafter, a flea- or louse-infested animal in the kennels is rarely found. Sarcoptic mange is also well controlled by the routine practise of dipping new animals. On the day after being given the dip for fleas and lice, all new dogs receive the first of three treatments with lime and sulphur solution. Two more treatments are given at intervals of a week, and this serves to keep our cases of sarcoptic mange at a low level. Treatments are given by the tank method, the animals being placed in a metal crate which holds two to four dogs, depending on their size; this crate is lowered several times into a tank of the lime and sulphur solution, the animals being completely immersed for a second, and then raised. There are a few obstinate cases always present to act as sources of infection, and also a few new cases continually being shipped in. Any cases appearing in the kennels are treated by the method described; if any small areas of infestation remain after a course of dipping and are slow in healing, such spots are painted with a mixture of sulphur and oil. Out of several hundred dogs constantly under observation, there are seldom more than ten or fifteen under treatment for scabies at one time.

The lime and sulphur solution which we use is a concentrated preparation manufactured by a chemical company, and tests between 32° and 33° Baume. For use, it is diluted with six parts of water, and we have found it very convenient and economical.

Mange caused by the *Demodex folliculorum* is uncommon. For reasons which everyone who has had much experience with this disease will understand, we find it most efficient to use an animal thus affected in an acute experiment, rather than to subject it to a tedious course of treatment, which at best is uncertain in results. Formalin is recommended by some, but the discomfort

to the patient is intense. We have recently started a test of the treatment recommended and demonstrated by Marsteller, at the meeting of this society last year, but are not yet prepared to give our opinion of the method.

Internal parasites.—It is our observation that ordinary degrees of infestation with the common round worms and tapeworms in mature dogs are generally of little importance. We recognize the seriousness of intestinal parasites in young growing animals. In the majority of our dogs that come to necropsy, varying degrees of ascariasis and taeniasis are evident, but it often happens that heavily infested animals are in excellent condition; many even fail to show local intestinal irritation. For this reason no routine attempt is made to rid the dogs of intestinal parasites. In our experience, however, oil of chenopodium has proved most effective for round worms.

From the standpoint of actual damage to the host, it appears that hookworm infestation is the most serious; certainly there is more evidence of injury to dogs from hookworm than from any other intestinal parasite. Carbon tetrachloride is, of course, the drug par excellence for treatment.

For tapeworms, we can endorse the use of arecoline hydrobromide, as recommended by Lentz, except that we would suggest slightly larger doses. We have used this drug in a few cases of privately owned dogs with more satisfaction to the owner and ourselves than any other drug. The promptness with which the taenia are expelled is striking.

Diseases of the eye.—The most common disorders of the eye are catarrhal and purulent conjunctivitis, and parenchymatous and ulcerative keratitis. They all seem to be closely related, as any of the milder forms of conjunctivitis are capable of developing into the more severe forms of keratitis. The etiology of these diseases is not entirely clear, but they may follow distemper, local irritation and injuries, and in some instances are certainly due to specific infection. Certain observers have demonstrated ophthalmia as a result of faulty diet, an apparent lack of the fat-soluble vitamin.

We have isolated from cases of ulcerative keratitis a long-chained streptococcus in pure culture. Control cultures from the conjunctival sac of healthy eyes are always negative, if due care is taken to avoid contamination of the swab used in culturing. Treatment for all forms of conjunctivitis and keratitis is routine. The conjunctival sac is washed out with a 1 to 1000 solution of

bichloride, followed by the application of yellow oxide of mercury ointment. A 1 to 1000 solution of bichloride in olive oil is to be recommended also. We believe that there need be no hesitation in using bichloride in what appears to be a strong solution for eye work; at least no untoward results from its use have been observed, and results appear more speedily than with the milder antiseptics.

Ulcerative and gangrenous stomatitis.—The incidence of these conditions is very irregular. Most of our cases have been seen in the winter months and occur in poorly nourished animals, those having extensive caries of the teeth, and so forth. Only one case has been observed in the last six months.

Textbooks mention the presence of *Actinomyces necrophorus*, *Bacterium septicum*, and *Bacterium coli* in the affected tissues. It is conceivable that almost any organism might be found in such lesions of the mouth without etiologic significance. We have been interested to observe the presence of *Bacillus fusiformis*, and spirillae as found in cases of Vincent's angina in man, an ulcerative condition of the tonsils, and also in cases of pulmonary gangrene. These two microbial forms are always associated, and it is thought that the spirillae result from longitudinal division of the *Bacillus fusiformis*. Some authors regard *Bacillus fusiformis* as the cause of Vincent's angina, and there is no reason why it should not have a similar rôle in ulcerative and gangrenous stomatitis of animals. In support of this view, Kline has recently reported the production of gangrene experimentally. He used material from cases of dental caries, of Vincent's angina, and of pulmonary gangrene, all containing spirillae and *Bacillus fusiformis*, and was able, in the presence of dead tissue, to cause gangrene in guinea pigs. He also produced pulmonary gangrene in a rabbit with similar material.

If animals with ulcerative and gangrenous stomatitis have diseased teeth, the latter are extracted, and the diseased tissues completely extirpated; this is followed by daily irrigation with Dakin's solution.

Deficiency diseases.—Osteomalacia will be the only disease of this type discussed. We reported a similar condition, designated "kennel lameness," some time ago, and have come to regard it as a type of osteomalacia peculiar to the particular conditions under which animals are held. It presents marked softening of the ribs, pelvis and some vertebrae, with resultant deformities of these structures and a typical stiffness in gait. It occurs in only

a few animals and is a result of faulty metabolism, rather than any general lack of food factors. If the latter condition prevailed, much more of the disease would be seen. It can be prevented by increasing the mineral intake of the animal, feeding liberal quantities of meat, by the administration of cod liver oil and calcium phosphate, and by increasing the exercise taken by the animal.

Renal calculi.—Renal calculi in the dog are generally regarded as rare; Hutyra and Marek place the incidence at 0.3 per cent. In our series of 433 consecutive animals, examined postmortem between December, 1921 and October 1, 1922, we found fifty with varying degrees of stone formation in one or both kidneys, an incidence of 11 per cent. It is possible that further examinations will lower this percentage, and examinations are to be conducted to determine this point.

Rabies.—It is a matter of interest that, in a period of more than two years during which nearly four thousand dogs were received, only one case of rabies occurred. The diagnosis was checked by laboratory methods.

Infectious sarcoma or infectious venereal granulomas.—This condition which used to be seen mostly in highly bred dogs of certain breeds has become quite general, and is now seen in many types of dogs. An animal was recently examined in which the primary lesion was in the vagina and the condition had metastasized to the liver and spleen.

Anatomical anomalies.—Various anatomical anomalies are seen, both antemortem and postmortem. The more interesting include a case of congenital diaphragmatic hernia and two cases of pseudo-hermaphroditism.

DISEASES OF RABBITS

Rabbits are subject to a greater variety of diseases than other small laboratory animals, with the exception of cats. Snuffles and coccidiosis cause many deaths. Ear mange, diarrhea and other intestinal disturbances are less fatal but quite common in occurrence.

Snuffles.—Snuffles takes its name from the snuffling breathing of rabbits having the disease; it is very infectious, is favored by exposure, and damp, insanitary surroundings and is attended by a high mortality. There is sneezing, a watery discharge from the nose, which later becomes purulent, followed by weakness and general prostration. Little can be done in treating the con-

dition, but efforts should be made to control the spread of the infection. This is best accomplished by disposing of all sick animals and burying them deeply or incinerating; pens and runs must be thoroughly cleaned and disinfected and made sanitary.

Coccidiosis.—Coccidiosis in rabbits is caused by *Coccidium cuniculi*, an animal parasite. It is fatal to young rabbits; old rabbits have abscesses in the liver, sometimes without apparent harm. The parasites are expelled with the droppings of diseased animals, which facilitates the spread of the disease. It is claimed that the parasites must live outside the host for five days in order to be infective for others; this cycle of development makes it possible to control the spread of infection by thorough cleaning and disinfection of pens and runs every five days. Besides hygienic measures, treatment is of little value.

Ear mange.—This condition is exceedingly common in rabbits. It is caused by the psoroptic mite and is easily recognized by the formation of brownish crusts within the ear. The infestation usually appears first deep within the ear, and gradually extends over the entire inner surface; thick, foul-smelling crusts and discharges finally fill the entire cavity in severe cases, and there may be involvement of the meninges which results in death. Rabbits with ear mange first show irritation of the organ by violent scratching of the ears and shaking of the head; the affected ear or ears begin to droop, and finally become entirely dependent on account of the weight of the material contained within them; if only one side is affected, the head is turned to one side.

This condition can be treated very satisfactorily, and the treatment is worth while, especially in valuable breeding animals. The ears should be thoroughly cleaned of all discharge, the crusts being softened with soap and water and entirely removed without injuring the ear. The material removed should be carefully disposed of, as it is usually teeming with the parasites. After thorough cleansing, the ears should be thoroughly covered inside and out with sulphur ointment; concentrated lime and sulphur may be poured into the ear and the excess drained out, or the ears may be dusted thoroughly with powdered sulphur. Several treatments at intervals of a few days or a week may be necessary in advanced cases; lighter cases will respond to two or three treatments. Thoroughness is essential. There is little likelihood of mistaking the condition, but diagnosis can be con-

firmed by examination of some of the discharge under the microscope.

Mange affecting the skin over the body is not seen to any extent in animals kept in clean quarters. The treatment is with sulphur ointments, lime and sulphur solution and so forth.

Diarrhea.—Diarrhea of rabbits may be caused by sudden changes in food, particularly changes in green food, by over-feeding of green stuff, and food that is not in good condition. The diarrhea is best treated by withdrawing all green food temporarily and placing the animal on a diet of grains, clean bright hay (alfalfa, clover or timothy) and pure drinking water. Judicious feeding of rabbits will prevent most of the intestinal disturbances to which rabbits are subject.

DISEASES OF GUINEA PIGS

The most fatal and common disease of guinea pigs is pneumonia, which is prevalent especially in the late winter and early spring months. It results from exposure to draughts and cold, confinement in damp cages, marked fluctuations in temperature, and probably a specific infection. Treatment is impractical, but a degree of prevention is possible. Guinea pigs absolutely will not survive in draughty quarters, nor will they tolerate marked fluctuations in temperature over short periods of time; extreme cold is also fatal.

Lice are very common on guinea pigs, but clean quarters keep this condition suppressed.

DISEASES OF WHITE RATS AND WHITE MICE

As in guinea pigs, pneumonia is responsible for the greatest losses among these animals. The same principles of prevention apply, as treatment is obviously impractical. White rats are sometimes affected with ear mange which can be treated the same as in rabbits.

The chief factors in handling all the smaller laboratory animals are, first of all, clean, dry quarters that are not subject to marked variations in temperature; second, a suitable diet, and for guinea pigs and rabbits especially, this must include some kind of green food the year round, such as sowed corn, alfalfa and clover in the summer, and carrots, beets, cabbage and so forth, in the winter. Even a very small allowance of such food in the winter will do much to make the animals thrive, and reduce losses from deaths without apparent cause. An adequate supply of roughage

in the form of clean hay should be available to rabbits and guinea pigs at all times. Clean drinking water is essential to rabbits, but guinea pigs do not require it if they are supplied constantly with green food or roots.

BIBLIOGRAPHY

¹Brimball, S. D., and Hardenbergh, J. G.: A study of so-called kennel lameness—Preliminary report. *Jour. Amer. Vet. Med. Assn.*, 1922, lxi, 145-154.

²Hutyra, F., and Marek, J.: Special pathology and therapeutics of the diseases of domestic animals. Chicago, A. Eger, 1916, p. 1100.

³Kline, B. S.: Experimental gangrene. *Jour. Infect. Dis.*, 1923, xxxii, 481-483.

A RARE CASE OF TUBERCULOSIS

There was recently forwarded to the Bureau of Animal Industry Laboratories, in Washington, a specimen of muscle tissue from a bull which had been shipped in for slaughter in a lot of 34 other bulls. A number of this lot were found to be badly infected with tuberculosis. The specimen was apparently a tumorous growth attached to the musculature and was, upon examination, found to contain organisms of an acid-fast type, having the size and form of bovine tubercle bacilli. The report of the Pathological Division stated, "This appearance of tuberculosis lesion is known as the proliferative form of tuberculosis, and seldom occurs except in very advanced cases." In this case, however, the lesions were not of the progressive type except that the muscle lesions reported were quite numerous, well marked, and were found on both hind quarters in the crural and gluteal muscles.

ANOTHER VETERINARY EXHIBIT

Dr. C. M. Christy, of Brookville, Pa., arranged a booth at the recent Forest County (Pa.) Fair, showing lesions of tuberculosis, photographs of reactions, etc., and in addition, had original placards giving data of local interest, and pamphlets furnished by the Federal Bureau of Animal Industry, describing the disease and its economic importance. This booth attracted about as much attention as any booth at the Fair and stimulated interest in the eradication of this disease. It has been found in that county that 62% of the tuberculosis among cattle can be traced to one herd. This exhibit shows what an enterprising local veterinarian can do to interest the general public in animal diseases.

DIAGNOSTIC SYMPTOMS AND DIFFERENTIAL TREATMENT OF VARIOUS FORMS OF COLIC IN THE HORSE¹

By G. H. MYDLAND, Horton, Kan.

The term colic is one which is very widely used by both laity and veterinarian in referring to innumerable and widely differing diseases of the horse, characterized by pain originating from the abdominal region. The term used in its most restricted sense should include only such affections as are manifested by pain originating from the digestive tract. Various writers have therefore classified colics as true and false. True colics are those as are mentioned above, in which pain originates from the digestive tract (stomach and intestines). False colics are those in which pain originates from a diseased state of any of the other abdominal organs, such as disorders of the urinary, reproductive and hepatic organs.

It will not be the purpose of this brief paper to try to take into consideration all of the various affections which might be included under the above two classifications but will limit it to a discussion of the symptoms and treatment of some of the more or less acute affections classed as true colics, most often encountered by the average practitioner. Neither will it be the purpose to offer anything new, but rather to review the symptoms and suggest such treatment as will be of practicable every-day use to the practitioner.

From the standpoint of practice, true colics may be classified as follows:

1. Acute dilatation of the stomach.
2. Simple impaction of the intestines.
3. Colic due to displacement of the bowel.
4. Flatulent colic.
5. Spasmodic colic.
6. Embolic colic.

ACUTE DILATATION OF THE STOMACH

This is a quite common affection of horses and is usually due to irrational or over-feeding. Later, fermentation of the ingesta takes place, causing a severe dilatation of the organ. History

¹Read before the annual meeting of the Missouri Valley Veterinary Association, Omaha, Nebr., July 23, 1923.

will disclose that the horse has usually had an overfeed of grain, or that the attack occurred shortly after feeding, following a hard day's work. However, sometimes attacks occur as long as seven or eight hours after feeding.

Characteristic symptoms are fullness of the abdomen and dyspneic breathing. The dilatation of the stomach interferes with the free action of the diaphragm. The pains are usually rather mild at the onset, becoming more severe the longer the attack lasts. However the pains rarely become very severe. The animal in the standing position will stand with lowered head, often leaning against the stall or wall. When lying down will either lie on its side or assume a sitting-dog position, to relieve the pressure from the diaphragm. Eructations of the esophagus take place in quite a number of cases and this is of great diagnostic value, when present. Vomiting is another symptom often noticed in this condition, but one must not always associate this act with rupture of the stomach, because vomiting can often occur without a ruptured stomach.

The most valuable treatment for this condition is the use of the stomach tube. This treatment should be tried for all cases of dilatation of the stomach and in the majority of cases the contents of the stomach can be liquified sufficiently with water so that they may be siphoned out of the tube. In a few cases one will encounter considerable difficulty in doing this, for it appears as though the walls have lost their contractile powers, causing no pressure on the ingesta. In this connection, I wish to say that I have completely discarded the use of the double tube in my own practice. The single tube is the only one which I have found to be practical.

It is often important that not all of the contents of the stomach be emptied out through the tube, at least too suddenly, as it will sometimes cause shock. It is advisable to leave about one or two gallons of water in the stomach, to which has been added some antiferment, such as eucamphine. In cases in which the stomach tube is not used, Dr. Quitman advises the administration of one-half ounce of salicylic acid in capsule. This treatment gives very good results in some cases.

SIMPLE IMPACTION OF THE INTESTINES

This form of colic constitutes the most common form encountered in the horse. Two forms may be recognized: (1) impaction of the small bowels and (2) impaction of the large bowels.

1. *Impaction of the Small Bowel.*—This is characterized by suppressed peristalsis, constipation and depressed attitude of the patient. In the early stages the temperature, pulse and visible mucous membranes usually remain practically normal, but if the case is neglected they will gradually become abnormal. The pains are more of the mild type, with intermittent spells of greater uneasiness. The patient seeks recumbency for considerable periods, often shows icterus, and diarrhea is frequently observed, which is of a considerably foul nature. The appetite is usually better in this form of colic than in other forms.

This condition is treated by the administration of an aloes bolus or hypodermic injections of arecoline hydrobromide or eserine salicylate, followed by small and often repeated doses of *nux vomica per os*.

2. *Impaction of the Large Bowel.*—This consists of an accumulation of feces in the cecum, colon or rectum. The most common of these is the involvement of the large colon. It has been my experience that it is rather difficult to differentiate, whether the trouble is due to the involvement of the cecum or colon, unless it can be accomplished by rectal exploration. Impaction of the cecum usually is of a chronic nature, with periodic and protracted pains. Impaction of the colon is characterized by more or less of an acute condition.

In this form of colic, rectal examination is of great value in establishing a diagnosis. The accumulated mass, unless too far forward, can be felt through the walls of the rectum as a more or less doughy mass. There is also usually more or less displacement of the bowel, due to the weight of the accumulation. Often the small intestines are found to be filled with gas, especially if the condition has existed for some time.

In general the characteristic symptoms are manifested by mild, periodic, colicky pains, crouching walk, hesitancy in lying down, bracing of the hind parts against some convenient wall, and suppressed peristalsis. This form of colic occurs nearly always during the fall and winter months when the horses are fed on dry, coarse feed, such as corn-stalks and straw.

The most valuable treatment of this condition consists of high rectal injections of large quantities of water. The farther one can insert the tube into the rectum the better. Several bucketsful of warm water should be pumped in. A considerable portion of the water will be forced out by straining, but some will flow forward and soften the accumulated mass. Some of the

rectal locks on the market are of great value in forcing the water forward.

As to purgatives, oils are to be preferred to the aloes bolus. Either raw linseed oil or one of the various neutral mineral oils on the market is suitable. From one pint to a quart should be given every twelve hours until relief is obtained. I often add to the oil some antiferment to prevent the formation of gas. Small and often-repeated doses of *nux vomica* are also prescribed for their stimulative effect on the bowel.

COLIC DUE TO DISPLACEMENT OF THE BOWEL

This form of colic includes such conditions as volvulus, torsion, intussusception and diaphragmatic, inguinal or scrotal hernia.

Considered collectively, they are characterized by very violent, colicky symptoms, of a very acute nature. With the exception of intussusception, whose symptoms are not always of such an acute nature, the pains are intermittent, sharp and rapidly increase in duration and intensity in a few hours, causing the animal to go through the most violent demonstrations, with entire disregard to self-inflicted injury. The animal will get up and down repeatedly, often falling with violent force to the ground. When standing, it walks about with head lowered and gait unsteady. The pulse soon becomes weak, mucous membranes are injected and there is trembling of the muscles at various parts of the body.

Rectal examination is often of material aid in diagnosis, especially if the displacement is of the colon. Where there is displacement of the small intestines, one can often suspect it by the intense bloating sometimes found in the latter.

Treatment is very unsatisfactory except in case of strangulated hernia, in which case surgical intervention is the usual method. Occasionally the displacement might be corrected by rectal manipulation, but I have found that it is an exceedingly difficult thing to accomplish, as one has not enough leverage to handle the weight involved. Rolling the patient is also advocated but I have never attempted it in my practice.

If diagnosis can be established early in the attack, stimulation of peristalsis by the use of eserine or arecoline, together with liberal use of oil, may be of benefit.

FLATULENT COLIC

This is ordinarily known as acute indigestion, intestinal tympany or wind colic. It is due to the fermentation of undigested

food causing a rapid accumulation of gas in the digestive tract. Either the stomach or intestines may be involved. If the stomach alone is affected the condition is closely allied to acute dilatation of the stomach from overfeeding.

The most outstanding symptom is a rapid distension of the abdomen by the gas. At first only the right side may be distended, but later as more gas accumulates, both sides will be about equally affected. If the distension is extreme the animal lies down with great care and rolls but little. Most of the usual symptoms of colic are in evidence. The animal being in great pain, breathing is greatly increased, being short and broken, now and then with a short-drawn sigh. The pulse is fast and weak. The visible mucous membranes are highly injected. Temperature may be slightly elevated. Patchy perspiration covers the body. Peristalsis is replaced by tinkling sounds. If relief is not soon attained the patient succumbs in a few hours.

Enterocentesis should be the first line of treatment resorted to in this ailment, especially if the flatulence is severe. However, this will only be of benefit in intestinal flatulence. In gastric flatulence, the stomach tube should be resorted to at once. After the gas has escaped through the canula, some antiseptic, well diluted with water, should be injected directly into the bowel through the canula, to counteract the formation of more gas. Antiseptics useful for this purpose are carbolic acid, liquor cresolis compositus and eucamphine.

In order to free the bowel of the fermenting material, purgatives should at once be given. The quick-acting ones, such as eserine, are to be preferred. Salol or naphthalin, in two-dram doses, should be given *per os*.

SPASMODIC COLIC

This form of colic is characterized by sharp and intermittent pains alternating with periods of apparent easiness. It is usually caused by large drinks of cold water when the animal is warm; indigestible food; cold rains; drafts; etc. It is more often met with in highbred, nervous horses. An animal suffering from this form of colic evinces the most intense pain; throwing itself recklessly down; rolls; gets up; paws; strikes, sweats and makes frequent attempts to pass urine. During periods of ease the animal may go to eating for a short time, only to have the attack recur with equal or more severity than before. Peristalsis is generally greatly increased. Diarrhea often becomes an.

associated symptom and though spasmodic colic will not, as a rule, cause great concern, it may lead to volvulus, intussusception, ruptures, etc.

Antispasmodics are indicated for the treatment of this form of colic. Morphine sulphate hypodermically in four-grain doses, or chloral hydrate in one-ounce doses, well diluted with water and given *per os* may be used.

EMBOLIC COLIC

This form is rather difficult to differentiate from other forms of colic. The attack comes on with no regard for digestive periods. In other respects the symptoms are very similar to those of spasmodic colic except that diarrhea does not occur, as is sometimes the case with the latter. The most practical diagnostic aid is the history of previous similar attacks, occurring at variable hours from no apparent cause.

As to treatment, exercise is justified in order to raise the blood pressure with hope that by so doing the thrombus may be disintegrated or collateral circulation hastened. Anodyne medicines, such as morphine or chloral, are also indicated to lessen the pain.

PROGRESS IN TUBERCULOSIS ERADICATION

The annual report of the Tuberculosis Eradication Division of the Bureau of Animal Industry for the fiscal year ending June 30, 1923, contains much information regarding the progress of the work. The following, taken from this report, will be of undoubted interest to veterinarians engaged in the movement.

There were tested during the year approximately 3,500,000 head of cattle, from which were removed about 114,000 reactors, which was slightly over 3 per cent of the total cattle tested. These reactors were obtained on 31,500 infected premises.

The accredited herds at the end of the year totalled 28,500, containing about 615,000 head of cattle. This is an increase of approximately 76 per cent in herds and 69 per cent in cattle.

The once-tested free herds at the end of the fiscal year were over 312,000 containing over 2,700,000 head of cattle, an increase of 93 per cent in herds and 76 per cent in cattle.

The total cattle reported under supervision at the end of the year was about 4,500,000.

TEMPERATURE, PULSE, AND RESPIRATION OF FOXES

By KARL B. HANSON and H. L. VAN VOLKENBERG

Bureau of Biological Survey, U. S. Department of Agriculture.

A study of the body temperature, frequency of pulse, and rate of respiration of apparently healthy foxes was undertaken by the writers over the period from December, 1919, to May, 1923 inclusive, on foxes at the U. S. Experimental Fur Farm, Keeseville, N. Y., and on various private ranches, to determine if possible the normal in these matters. Observations also were made of sick foxes to ascertain whether the data regarding temperature, pulse, and respiration would be of value in diagnosing disease.

While making the necessary observations, foxes over two months old were restrained by fastening a pair of self-locking tongs around the neck, each animal being laid on its side and an assistant clasping the handle of the tongs and the front legs of the fox in one hand and the hind legs in the other. Pups under two months old were held either in the hands or arms of an assistant.

The temperature readings were taken with a clinical thermometer, inserted into the rectum and allowed to remain there three to five minutes, after the mercury had been shaken below 95° F. The pulse frequency was obtained by palpation of the femoral artery. The respiration frequency was determined by counting the rise and fall of the sides or ribs. In pups less than six weeks old the pulse rate was not taken by palpation of the femoral artery, but the rate of heart beats was determined by auscultation of the thorax. A physician's stop watch was used in counting the pulse beats and respiration.

TEMPERATURE, PULSE, AND RESPIRATION OF FOXES OF DIFFERENT AGES

In the following table is given a summary of the temperatures and frequency of pulse and respiration of apparently healthy foxes (*Vulpes fulva*) of different ages:

Age (in Days)	No. of Observations	Temperature		Pulse		Respiration	
		Average	Range	Average	Range	Average	Range
6	3	97.2	96.4- 97.8	269*	240-288*	58	47- 69
8-16	40	97.7	96.4- 98.6	200*	144-300*	41	24- 67
22-25	6	99.8	99.0-100.5				
30-39	19	101.3	100.4-102.6	159*	144-180*	56	36- 78
40-49	33	102.4	99.9-105.0	140	108-180	63	36- 96
50-59	34	102.5	100.5-104.8	141	108-180	50	30- 84
68-72	13	103.2	101.8-104.3	152	132-168	48	36- 66
87	14	105.0	104.4-105.6	155	132-198	122	42-216
100	25	102.8	100.4-105.8	176	138-234	92	30-192
130	24	104.2	101.5-106.0	152	138-192	95	32-168
Adults	419	103.9	101.0-107.9	130	71-274	54	20-216

*Heart beats.

In young fox pups the temperature tended to increase with age, a condition just the reverse of that observed in many species of domestic animals. This was probably due to the fact that catching and holding the older animals is associated with more excitement and struggling. The frequency of the pulse tended to decrease with age, while the respiration rate showed no marked change except that it became more variable.

After foxes were a month old a wide range was observed in the temperature, pulse, and respiration. This extreme variability in the same and in different foxes is probably due to the fact that the older animals become greatly excited and struggle considerably when held. Indications are that the temperature, pulse, and respiration observed in the average fox caught and held are frequently not the actual normal but above it.

SUMMER AND WINTER RECORDS

Following is a summary of the summer and winter records of the temperature, pulse, and respiration of foxes of the species *Vulpes fulva* from observations made at the U. S. Experimental Fur Farm, Keeseville, N. Y., the winter records being taken during December, January and February, and the summer records during June, July and August.

Season	No. of Observations	Temperature		Pulse		Respiration	
		Average	Range	Average	Range	Average	Range
Winter	60	103.6	101.0-106.0	146	84-250	35	26- 42
Summer	44	103.9	100.7-106.6	161	124-264	82	27-246

There was no marked difference between the summer and winter records of the temperature readings and the frequency of pulse. The rate of respirations, however, was greater in the winter. On exceptionally hot days some foxes tended to show a higher temperature than usual.

DATA FROM MALE AND FEMALE FOXES COMPARED

A comparison of the temperature, pulse, and respiration of apparently healthy adult males with those of apparently healthy adult females of the species *Vulpes fulva* is given below:

Sex	No. of Observations	Temperature		Pulse		Respiration	
		Average	Range	Average	Range	Average	Range
Male	208	103.3	101.0-107.9	127	71-264	51	21-198
Female	211	104.4	101.0-107.4	134	84-198	56	20-216

The average temperature was higher in the males than in the females. There was no appreciable difference, however, in the pulse and respiration rate. Although there may be a difference in temperature due to sex, it was observed that many males had a higher temperature than many females, as indicated by there being practically no difference in the range of temperatures of the two sexes.

EFFECT OF EXCITEMENT ON THE TEMPERATURE, PULSE, AND RESPIRATION

To determine the effect of excitement on the temperature, pulse, and respiration, observations were made upon 83 foxes coincident with the administration of anthelmintic treatment. These animals were confined in small cages, which eliminated chasing in catching. Each one was caught, weighed in a burlap bag, and given the anthelmintic dose after removal from the bag, and the temperature, pulse, and respiration of each were taken three times: (1) Just after catching; (2) just after removal from the bag; and (3) while the dose was administered. A summary of the average temperature, pulse, and respiration records of these animals follows:

When Taken	Average Temperature	Average Pulse	Average Respiration
After catching.....	103.7	130	65
After weighing.....	104.6	136	70
While administering dose.....	104.7	142	87

To emphasize more clearly the rapid and great changes which occurred in the temperature, pulse, and respiration in some individuals in the above test, four cases are cited:

Fox No.	After catching			After weighing			When administering dose		
	Temp.	Pulse	Resp.	Temp.	Pulse	Resp.	Temp.	Pulse	Resp.
19	104.3	96	36	106.0	168	52	106.8	90	100
25	101.5	135	39	102.6	150	39	104.2	138	93
22	104.1	162	38	105.3	150	100	106.5	156	210
18	103.0	138	44	105.5	144	160	106.0	150	144

The above results demonstrate that the temperature, pulse, and respiration of foxes may be subject to rapid and marked changes, especially if the animal is of a highly nervous temperament.

The average respiration frequency of 53 foxes which were not caught and held and which were disturbed as little as possible while under observation, was 32, with a range of 21 to 48. It should be noted that this average and range is considerably less than in those foxes which were caught and held. In order to obtain the normal rate of respiration of the average fox, the indications are that the animal should not be caught or disturbed. It is believed that the same holds true with regard to the temperature reading and pulse rate. It is impossible, however, to obtain these without catching the animal and disturbing it.

BLUE FOXES

In the case of blue foxes (*Alopex spp.*) 67 observations were made with the following showing of temperature and pulse:

	Average	Range
Temperature	104.8	102.4-107.7
Pulse	126	72-162

In the blue foxes, as in the blacks, crosses, and reds, a marked range and variation of the temperature readings and pulse rate were observed. The blue foxes showed a higher average temperature. This may have been due to the fact that most of them were confined in large pens and had to be chased considerably before they could be caught.

EFFECT OF DISEASE

To determine the temperature, pulse, and respiration of sick foxes, in outbreaks of fox influenza, 104 observations were made with the following results:

	Average	Range
Temperature	103.1	99.0-106.5
Pulse	121	68-380
Respiration	29	18-40

The temperature readings and the frequency of pulse and respiration gave no information of assistance in the diagnosis of fox influenza. The rhythm and strength of the pulse and the rhythm, intensity, and sounds of respiration frequently were a better index of the animal's condition than the rate.

The following cases are cited to demonstrate that temperatures of less than 100 degrees in sick foxes over two months old frequently indicate an unfavorable prognosis:

Blue fox No. 4 showed a temperature of 96.4 about two hours before death. This animal suffered intoxication from a dose of chloroform, used in an anthelmintic test. The temperature of this animal when well ranged from 103.8 to 107.2.

Blue fox No. 6, the temperature of which normally ranged from 102.6 to 104.9, died about an hour after showing a temperature of 98.2. This animal suffered intoxication from a dose of thymol, used in a test for the removal of intestinal parasites.

Red fox No. 3, apparently healthy, showed a temperature of 105.2 before the administration of a toxic dose of oil of chenopodium. About an hour before dying, and while manifesting marked prostration, this animal showed a temperature of 101.4.

In only one instance, the following, have we observed that a fox had a higher temperature when sick than when well.

Red fox No. 31, when apparently well, gave temperature readings ranging from 104 to 105. About a week after whelping a litter of pups, she became sick and showed a temperature of over 110 degrees. As the thermometer scale was graduated to only 110 degrees, the exact temperature could not be determined. Upon autopsy, endometritis and lesions indicating a generalized infection were observed.

CONCLUSIONS

The temperature readings of young fox pups tend to increase with age, while, to an extent, the pulse frequency decreases. After reaching seven weeks of age the temperature, pulse, and respiration of foxes held and handled while under observation were found subject to sudden changes and a wide range of variation. This is probably due to the nervous temperament which the animals develop after reaching a certain age.

In apparently healthy adult foxes, caught and held, it was found that the average temperature was 103.9, with a range from 101.0 to 107.9; the average pulse rate was 130, with a range from 71 to 274; the average frequency of respiration was

54, with a range from 20 to 216. It is not believed that these represent the actual normal, since a certain deviation apparently occurs when the animal is disturbed by being caught and held.

There was no marked difference between the summer and winter records of temperature and frequency of pulse. The rate of respiration, however, was higher in summer than in winter.

Females showed a higher average temperature than males, but there were many exceptions. The pulse and respiration rate differed only slightly in males and females.

Increased temperature, pulse, and respiration apparently were caused by the unavoidable excitement and struggling associated with catching and handling.

The respiration frequency in foxes which were not handled or disturbed while under observation was lower and less variable than in those caught and held. The average frequency was 32, with a range of 21 to 48. The figures probably approximate closely the actual normal respiration rate of foxes.

The average temperature of blue foxes was 104.8 and the pulse 126. In blue foxes, as in blacks, crosses, and reds, the temperature and pulse were subject to rapid changes and a wide range of variation.

The temperature readings and the frequency of pulse and respiration of foxes usually offer little information of clinical importance. The use of the thermometer apparently is limited largely to the detection of subnormal temperatures attended with an unfavorable prognosis, and to the detection of some cases of marked pyrexia. Temperatures of less than 100 degrees in foxes over two months old usually are subnormal. Clinically, the rhythm and strength of pulse and the rhythm, intensity, and sounds of respiration apparently are of more importance than the rate.

AT MONTREAL

It is said that during the recent A. V. M. A. meeting, in Montreal, a visitor from the United States had been imbibing rather freely, if not wisely. He was studying one of the old churches, on which were placed twelve heroic bronze figures of the apostles, high up on the wall. Just at this moment a fire alarm sounded. The American looked up at the statues and said, "Don't jump boys, the firemen will be here in a minute with the net!"

SOURCE OF THE VITAMINS IN MILK*

By LOUIS A. KLEIN,

School of Veterinary Medicine, University of Pennsylvania

Three vitamins have been shown to be present in milk, namely, fat-soluble A, water-soluble B, and the antiscorbutic vitamin, also called vitamin C. Milk may contain other vitamins but the presence of only these three has been proven conclusively. Ninety percent or more of the fat-soluble A is contained in the milk fat and therefore, while cream and whole milk are rich in this vitamin, skim milk contains a comparatively small quantity of it. On the other hand, there does not appear to be any material difference in the content of vitamin B and vitamin C in whole and in skim milk.

The association of vitamin A with the milk fat naturally raised the question whether the quantity of vitamin A contained in whole milk and in cream is proportionate to the percentage of fat, other conditions being the same. Only one experiment¹ has been reported in which observations were made on this point and no definite conclusions were reached. This question is, therefore, still to be determined.

RELATIVE PROPORTIONS

Fat-soluble A is present in whole milk in much greater quantity than vitamin B. Tests made on experimental animals indicate that the quantity of fat-soluble A is eight times greater than that of B.² Whole milk, cream and butter are among the most prolific sources of fat-soluble A for man. Milk, both whole and skimmed, furnishes an abundant supply of vitamin B and a variable but ordinarily adequate quantity of the antiscorbutic vitamin.

The quantity of vitamins present is not always the same in different samples of milk. The quantity of the antiscorbutic vitamin varies to a greater extent than that of vitamins A and B. Funk,³ in 1914, expressed the thought that the antiscorbutic potency of milk might be influenced by the feed of the cow and in 1918 Steenbock, Boutwell and Kent⁴ expressed a similar opinion with regard to the variations in the quantity of fat-soluble A in butter fat. Other investigators expressed similar

*Presented at the annual meeting of the American Association of Medical Milk Commissions and Certified Milk Producers' Association, at San Francisco, Calif., June 25 and 26, 1923.

opinions with regard to these vitamins and vitamin B, but it was not until comparatively recently that the question was determined by feeding milk from cows, on a known diet or ration, to experiment animals, usually pigs and rats, under carefully controlled conditions and noting the results. Studies of the influence of the diet or ration of the cow on the antiscorbutic potency of milk were made by Hart, Steenbock and Ellis,⁵ Dutcher and his co-workers,⁶ and Hess, Unger and Supplee,⁷ and the results published in 1920, while similar studies of the effect of the cow's diet or ration on the quantity of vitamins A and B in the milk were made by Kennedy and Dutcher⁸ who reported their results in 1922. Although these experiments were carried out under different plans, the results of every one of them indicate that the quantity of the three vitamins excreted in the milk depends upon the quantity taken in with the food.

DEPENDENT ON RATION

It was observed that when the cows were changed from a vitamin-rich to a vitamin-poor diet or ration, a corresponding change occurred in the milk in 2 to 4 weeks^{7,9} and that when a change was made from a vitamin-poor to a vitamin-rich diet or ration, the experiment animals being fed on the milk showed the effects of an increase in the vitamins within several days.⁵ From these observations and others of a similar character, it has been concluded that the vitamins are not stored in the animal body in any considerable amount and that the constant presence of vitamins in the milk in adequate quantity will depend on the continuous feeding of a vitamin-rich ration. The vitamin content of the various cattle feeds is therefore of practical importance in the production of vitamin-rich milk.

Considerable information on this phase of the subject has been obtained from the investigations which have been reported up to the present time.⁹ It has been found that those feeds which consist largely of the leaves of plants, such as grass, clover, alfalfa and other forage plants, are, when in the green state, the most prolific sources available of fat-soluble A and the antiscorbutic vitamin, and that they supply as great a quantity of vitamin B as any other kind of feed. When these plants are dried and cured to make hay, however, much of the antiscorbutic vitamin is destroyed or rendered inert. This explains why milk from cows on green pasture has a greater antiscorbutic potency than milk from cows on dry feed when tested on guinea pigs^{5,6,7}.

When the pasture is dried and bleached, however, as occurs during a drought, the antiscorbutic potency of the milk is no greater than when the cows are on dry feed. Drying of the pasture also decreases the quantity of fat-soluble A in the milk¹⁰ and there is reason to believe that the same thing will occur when hay is exposed to the sun too long in the swath.¹¹ In a study of the effect of maturity on the content of vitamin B in alfalfa, clover and timothy, it was found that hay made from young plants contained a greater quantity of this vitamin than hay made from mature plants.¹² When mowing is done at a suitable time and curing is properly done, however, hay is for all practical purposes as rich in fat-soluble A and vitamin B as the green forage, but the quantity of the antiscorbutic vitamin present is considerably less.

VITAMINS IN GRAINS

The grains, corn, oats, wheat, rye, and barley, contain an abundant quantity of vitamin B and a small quantity of fat-soluble A, but are deficient in the antiscorbutic vitamin.⁹ The air-drying to which these crops are subjected has no effect on the A and B vitamins they contain.

There is no uniformity in the vitamin content of the different mill feeds or concentrates. This is because the individual feeds consist of different parts of the whole seed or grain and these different parts do not contain the vitamins in the same proportion. Wheat bran contains a relatively large quantity of vitamin B, but is deficient in vitamin A and the antiscorbutic vitamin. Wheat middlings contains about twice as much vitamin B as bran¹³, but is no richer in the other two vitamins. No tests are reported on the vitamin content of oil meal, cotton-seed meal and soy-bean meal, but the seeds from which these meals are prepared after the oil has been extracted have been shown to contain an abundance of vitamin B and a relatively large quantity of vitamin A. There is no information available at present concerning the vitamin content of gluten meal, gluten feed, hominy and dried brewers' grains.

No reports have yet been published of tests made for the specific purpose of determining the vitamin content of corn ensilage. In their study of the influence of the diet or ration of the cow on the antiscorbutic properties of the milk, Hart, Steenbock and Ellis⁶ demonstrated that ensilage made from corn, well-matured and partly dried, was deficient in the antiscorbutic

vitamin but there are no other experimental data on the subject. When ensilage corn is cut early and put into the silo green, it is no doubt rich in vitamins, but the effect on these substances of the fermentation which occurs in the silo is not known.

Of the roots used as cow feeds, only carrots contain vitamins A and B in sufficient quantity.^{9,14} The antiscorbutic vitamin is present in relatively large quantity in carrots and sugar beets.⁹ No tests of dried beet-pulp have been reported, but from what is known of the susceptibilities of the antiscorbutic vitamin it appears very likely that it is destroyed entirely or very much reduced in quantity or potency by the processes to which the beet pulp is subjected.

The information available at this time as to the vitamin content of the various cow feeds is by no means complete. Further investigation is needed, not only as regards certain feeds, the vitamin content of which has not yet been determined, but also as to the influence of soil conditions on the vitamin content of plants, it being now generally assumed that the plants obtain the vitamins from the soil.

EFFECTS OF PASTEURIZATION

It has been demonstrated that certain influences, to which milk may be subjected after it is drawn from the cow, decrease its antiscorbutic potency. Pasteurized milk has been shown to be weaker in its antiscorbutic power than unheated milk. Babies which developed incipient scurvy while being fed on pasteurized milk recovered when they were given raw milk, fruit juices, or potato water.¹⁵

The lower antiscorbutic potency of the pasteurized milk is not attributed entirely to the heating to which it is exposed, but partly to the circumstances that it is heated in the presence of air and partly to the age of the milk. When milk is heated in a vacuum, it may be exposed to temperatures as high as 240° F., as in the preparation of dried milk by the Just roller process, without any material weakening of its antiscorbutic power, while exposure to oxygen alone will render it deficient in this respect. It has also been demonstrated that the antiscorbutic power of unheated milk deteriorates with the passage of time, after it has been drawn from the cow. This is an observation which has a practical application in connection with the time of the delivery of milk. It should be noted that the cases of scurvy reported above, as developing on a diet of pasteurized milk,

were of an incipient character. It is believed to be exceptional for a well-marked case of scurvy to develop on a diet of this kind, as milk, even when pasteurized, possesses some antiscorbutic properties.¹⁶

Neither pasteurization nor age seems to have any effect on the potency of the vitamins A and B in the milk.

REFERENCES

- ¹Drummond, J. C., Conrad, K. H., and Watson, A. F., *Biochem. Journal*, vol. 15, no. 4, 1921, pp. 546 to 552.
- ²Steenbock, H., Sell, M. T., and Nelson, E., *Wisconsin Sta. Bull. No. 339*, 1922, pp. 123 and 124, 130 to 132.
- ³Funk, C., *Die Vitamine*, 1914.
- ⁴Steenbock, H., Boutwell, P. W., and Kent, H. E., *Jour. Biol. Chem.*, vol. xxxv, 1918, 517.
- ⁵Hart, E. B., Steenbock, H., and Ellis, N. R., *Jour. Biol. Chem.*, vol. xlii, no. 3, 1920, pp. 383 to 396.
- ⁶Dutcher, R. A., Eckles, C. H., Dahle, C. D., Mead, S. W., and Schaefer, O. G., *Jour. Biol. Chem.*, vol. xlv, no. 1, 1920, pp. 119 to 132.
- ⁷Hess, A. J., Unger, L. J., and Supplee, G. C., *Jour. Biol. Chem.*, vol. xlv, no. 1, 1920, pp. 229 to 235.
- ⁸Kennedy, Cornelia, and Dutcher, R. A., *Jour. Biol. Chem.*, vol. 1, no. 2, 1922, pp. 339 to 359.
- ⁹*The Vitamine Manual*, Walter H. Eddy.
- ¹⁰Drummond, J. C., Conrad, K. H., and Watson, A. F., *Biochem. Jour.*, vol. xv, no. 4, 1921, pp. 546 to 552.
- ¹¹*Wis. Sta. Bull. 339*, 1922, pp. 123 and 124, 130 to 132.
- ¹²Osborn, T. B., and Mendel, L. B., *Jour. Biol. Chem.*, vol. xxxix, no. 1, 1919, pp. 29 to 34.
- ¹³Bell, M., and Mendel, L. B., *Am. Jour. Physiol.*, vol. lxii, no. 1, 1922, pp. 145 to 161.
- ¹⁴Steenbock, H., and Gross, E. G., *Jour. Biol. Chem.*, vol. xl, no. 2, 1919, pp. 501 to 532.
- ¹⁵Hess, Alfred J., *Proceedings Soc. Exp. Biol. and Med.*, vol. xiii, no. 3, 1915.
- ¹⁶Hess, Alfred J., and Unger, Lester J., *Am. Jour. Dis. of Children*, vol. xvii, 1919, pp. 221 to 240.

ADVERTISING AN ACCREDITED HERD

The Federal Bureau of Animal Industry is in receipt of an interesting photograph from Oregon which is indicative of the interest being taken in accredited-herd work, by one of the Japanese farmers. This progressive individual, who has established a tuberculosis-free accredited herd, has advertised the same by placing the words "T. B. Free Accredited Jerseys" in large letters on the fence in front of his place so as to make the same visible from the main state highway, and the interurban and steam lines which pass the place. He has, undoubtedly, found this a valuable means of advertising.

VETERINARY CONFERENCE NEXT JANUARY

The Annual Conference for Veterinarians will be held at the Veterinary School of the University of Pennsylvania on Tuesday and Wednesday, January 8-9, 1924. The program will consist of papers and discussions of special interest to practitioners. Reserve the dates and make your plans to attend. Those who attended the previous conferences felt that their time had been well spent. Programs will be printed and mailed about the latter part of December.

URINARY CALCULI IN SHEEP¹

By HARRY P. SCOTT, *Brush, Colorado*

From the scarcity of literature on this subject, I am of the belief that the attention of very few authorities has been called to it. Since so very little has been published in regard to this condition, I wish to state that the following is more on the order of a case report than a paper.

On October 25, 1922, a band of 4200 lambs was shipped into Fort Morgan from Roswell, New Mexico. The band was divided equally and placed on farms about eight miles apart. There were in the band several hundred very light lambs, so that the average for the lot was only 44 lbs. Although they were small and thin all appeared to be in a healthy, thrifty condition and continued so up until the time that losses first occurred from calculi.

That portion of the original band in which the losses occurred was turned out, at first, into a corn field and had access also to alfalfa pasture. At night they were corralled and fed alfalfa hay. The corn field and pasture lasted about a month; then the lambs were kept penned and fed a ration consisting of shelled corn, linseed meal and alfalfa hay.

Salt was supplied, first in blocks, but when the lambs were penned up it was supplied loose and fed in a trough. The oil meal and shelled corn were gradually increased, until the lambs were on full feed, when they were taking one and one-half pounds of corn and four ounces of meal per day. The feeder also stated that at this time they would clean up 100 pounds of pulverized salt per day.

No losses, other than could easily be accounted for, were experienced until the 25th of March. At this time two lambs suddenly died and a number were noticed to be off feed and acting peculiarly. The next day two more lambs died and several more were off feed. We were called in at this time and posted two lambs. On the first we found the abdominal cavity filled with an amber-colored fluid. Upon further examination a large clot of blood was found adhering to and enmeshed in the omentum.

Search for the location or origin of the hemorrhage revealed a rupture on the bladder, some three inches in length. The walls of the bladder in this case showed no inflammatory changes, nor

¹Read before the semi-annual meeting of the Colorado Veterinary Medical Association, Fort Collins, Colo., May 31-June 1-2, 1923.

were the kidneys altered visibly. All other organs of the body were normal in appearance and lymph glands showed no signs of congestion. The second lamb posted revealed, in addition to a ruptured bladder, lesions of a chronic form of cystitis, as well as petechial hemorrhages on the kidney. In both cases the bladders were completely emptied, so that no calculi were found.



Fig. 1. Bladder and urethra opened to show calculi.

The next day several more lambs were posted and one was found in which the bladder had not ruptured, but in this case both ureters were greatly distended and the kidneys were twice as large as normal. Starting at the end of the penis the urethra was traced until the obstruction was found. The obstruction consisted of a mass of very small calculi, located posterior to the sigmoid flexure.

There being no known treatment for this condition, the owner was advised to ship all the wether lambs that were in a marketable condition and to reduce the meal and corn ration.

The complete urogenital tract was taken into Denver, by Dr. Stout of the Federal Service, and there an analysis was made both of the urine and of the calculi, which showed the following:

URINE

Hippuric acid (microscopically).....	present
Protein.....	present
Albumin	none
Reducing matter (Fehling)	none

CALCULI

Consisted of crystalline deposit of hippuric acid and amorphous, white lumps which were wholly phosphates.

A report made by the Agricultural College showed a specific gravity of 1020, with albumen present but no other unusual conditions. The calculi were found to be composed of magnesium phosphate.

The American literature seems to be particularly free from cases of this kind. The only discussion that we can find of the condition which is at all worthy of consideration is in Bulletin 112 of the Iowa Experiment Station. From some previous experience they had begun to suspect sugar beets as the cause of urinary calculi in sheep. As a consequence, they took four lots of lambs. To the first eleven they fed hay and grain only. To the second lot of nine they gave, in addition, corn ensilage. To the third lot of eleven they added mangels and to the fourth lot of eleven, sugar beets.

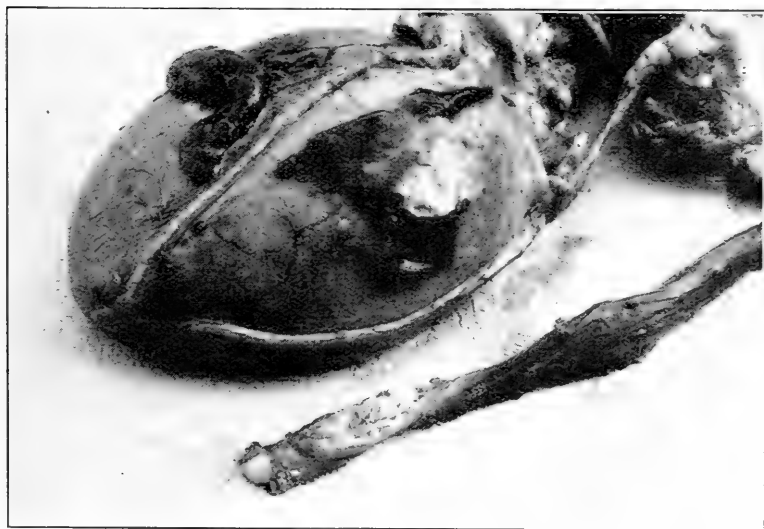


Fig. 2. Bladder showing two large blood-clots; penis below, with urethra slit open, revealing numerous small calculi.

The lambs were fed from September 11 to April 14. Altogether, three of the sugar-beet lambs died, one on January 31, one on February 18 and one on April 11. All three showed the presence of calculi in the bladder. On slaughtering, one of those left in the sugar-beet lot showed calculi in the kidneys, so that altogether, of the eleven given sugar beets, four showed the presence of calculi, whereas this condition was not present in any of the other lots. This seemed to be a strong case against sugar beets.

In the Colorado feeding district, tops are frequently fed to lambs for a short time after the beginning of the feeding season, but as far as we know no continuous feeding of the beets themselves has been practiced. The lambs under consideration in this article never received either the beets or the tops, so that it does not seem possible to attribute the condition in this case to the feeding of beets.

Suspicion points to the linseed meal, although there are other instances where as much oil meal was fed without untoward results.

BULLETIN ON SWINE DISEASES

The diseases and ailments which are important factors in reducing the profits of hog raisers, particularly the old enemy, hog cholera, are described and prescribed for in a new Farmers' Bulletin, 1244, "Diseases, Ailments, and Abnormal Conditions of Swine," prepared by Dr. T. P. White, of the United States Bureau of Animal Industry.

Although the ravages of hog cholera have been reduced sixty per cent below the worst years, lack of attention to herds and failure to apply all the precautions available leave it still the greatest menace to the industry. Much of the bulletin is devoted to this disease and to a number of diseases which in the time of a cholera outbreak go unnoticed or are diagnosed as cholera. These other diseases include anthrax, epilepsy, gastroenteritis, necrobacillosis, pleurisy, pneumonia, poisoning, swine plague (hemorrhagic septicemia), tuberculosis, and worms.

Many other diseases and abnormal conditions, including such common troubles as thumps, sore mouth, sunstroke, rickets, paralysis of the hind quarters, and rheumatism, are described and proper treatments are given. There are also chapters on the prevention of disease and on the causes of losses during shipment.

SINGLE TUBE METHOD FOR DETERMINING CARRIERS OF BACTERIUM PULLORUM¹

By F. R. BEAUDETTE, Manhattan, Kan.

The fact that poultry production is a profitable business has stimulated those engaged in this enterprise to give more attention to the problem of disease control. Since white diarrhea is one of the first diseases to make its appearance after hatching, and since the losses from this disease are very great, poultrymen are generally coming to see the need of controlling this scourge.

It has been known for some time that the hen is, in most cases, the source of infection. The fact that carriers may be detected by means of the agglutination test is also well known. However, poultrymen have not taken advantage of the test to any great extent, except in a few sections where campaigns have been carried on by state institutions. Perhaps the cost of the test has made it unprofitable, except in the case of pure bred flocks. The test is simple, yet, when conducted on a large scale, it involves considerable time and materials. Therefore, the advantages of a method requiring less time and materials can readily be appreciated by the laboratory worker. It is the purpose of this paper to describe a test which has proven equally as reliable as the old routine method and still requires only one agglutination tube.

The routine method employed in this laboratory was to secure a sample of blood from the fowl to be tested and make four dilutions of the serum as follows: A series of four tubes was used, 1.9 cc of saline was placed in the first, and 1.0 cc in each tube thereafter. One-tenth of a cubic centimeter of serum was then placed in the first tube and thoroughly mixed. From this one cubic centimeter was transferred to the second tube and thoroughly mixed. Transfers were made from the second to the third and from the third to the fourth tube, and a cubic centimeter from the fourth tube was discarded. Each of the four tubes now contained one cubic centimeter of a 1-20, 1-40, 1-80, and 1-160 dilution, respectively, of serum. To each tube was then added one cubic centimeter of the antigen, which doubled the dilution in each case, so that the final dilutions were 1-40, 1-80, 1-160, and 1-320. The tubes were incubated at 37°C. from 24 to 72 hours and readings made. If complete agglutination

¹Contribution No. 56, Department of Bacteriology, Kansas State Agricultural Experiment Station.

occurred in the 1-80 dilution, or above, the sample of serum was considered as being from an infected fowl.

In view of the fact that complete agglutination in dilutions of 1-80 or higher indicates infection, the use of more than one dilution seemed superfluous in routine testing and the test herein described is based on this point.

TABLE I
COMPARISON OF SINGLE-TUBE TEST WITH ROUTINE METHOD
(FLOCK OF H. E. R.)

Hen No.	Routine Method			Single-Tube Method
	Serum Dilution			Serum Dilution
	1-40	1-80	1-160	Between 1-80 and 1-100
110	0	0	0	0
116	0	0	0	0
109	0	0	0	0
107	0	0	0	0
119	0	0	0	0
111	0	0	0	0
105	XXXX	XXXX	XXXX	XXXX
120	XXX	XXX	XXX	XXXX
114	0	0	0	0
122	0	0	0	0
(FLOCK OF A. E. L.)				
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
5B	0	0	0	0
17	0	0	0	0
6B	0	0	0	0
14	0	0	0	0
V	XXXX	XXXX	XXXX	XXXX
11B	0	0	0	0
7B	0	0	0	0
1B	XXXX	XXXX	XXXX	XXXX
13B	0	0	0	0
FB	0	0	0	0

XXXX=Complete agglutination.

XXX₁=Marked agglutination.

0 =No agglutination.

THE SINGLE-TUBE TEST

The sample of blood is withdrawn from the wing vein of the fowl as usual. The blood may be allowed to clot while standing in the ice-box over night, or the tubes may be centrifugalized at once. Only one drop of serum is needed. In most cases this amount will collect in a tube of blood left standing in the ice-box over night, especially if the tubes are placed in a slanting position. A capillary pipette fitted with a rubber nipple is used to obtain a small amount of serum from the clot and one drop of the serum is added to a tube containing 4 cc of highly diluted antigen. Assuming that the drop represents from 1-20 to 1-25 of a cubic centimeter, the addition of this quantity to 4 cc of antigen results in a dilution of 1-80 or 1-100 depending upon the size of the drop. The tube is thoroughly shaken and placed in an incubator at 37°C. or left at room temperature. Readings may be made at the end of 48 hours and in some cases a positive reaction can be detected in five hours at 37°C.

Table I gives in parallel columns the results obtained from the same sample of serum taken from two small flocks and tested by both methods.

This method has been used simultaneously with the method previously described and in no case have the final results differed. In fact, the one-dilution method usually gives a more clear cut reaction, probably because of the higher column of fluid to be observed. The test has several advantages over the routine method that has been used. A smaller quantity of blood is used and this makes it possible for the bleeder to obtain a larger number of samples in a given time. The use of a capillary pipette fitted with a rubber nipple has advantages over larger pipettes in obtaining serum from the clot contained in small vials. Fewer tubes are needed for making the test and less time is required in making the dilutions. Because of its greater dilution, less than half as much antigen is required. The time required for incubation is reduced by at least 24 hours. In testing samples collected by inexperienced bleeders, frequently badly contaminated, excessive growth sometimes takes place in the routine method which obscures the reading of the results. In the single-tube method this can be largely obviated by incubating at room temperature.

TUBERCULIN SENSITIVENESS CAUSED BY DEAD TUBERCLE BACILLI

By A. B. CRAWFORD, Bethesda., Md.

Veterinary Inspector and Scientific Assistant at the Experiment Station of the United States Bureau of Animal Industry

As some doubt seems to remain that the injection of dead tubercle bacilli into the bodies of animals sensitizes them to tuberculin, the following experiment, made at the Experiment Station of the Bureau of Animal Industry, may prove of general interest.

On March 25, 1921, six tubes of Dorset's egg medium were inoculated with a strain of tubercle bacilli which had been under cultivation on artificial media more than a dozen years. On May 2, 1921, the growth on the tubes, which microscopically showed only acid-fast bacilli, was suspended in 100 cc of sterile physiological salt solution. The suspension was heated in a water-bath at boiling temperature for two hours, and was then cooled and shaken several hours in a shaking machine which makes about 800 revolutions per minute.

May 2, 1921. Six guinea pigs, injected intra-abdominally with the suspension as follows: Two, $\frac{1}{8}$ cc each; two, $\frac{1}{4}$ cc each; and two, $\frac{1}{2}$ cc each. The guinea pigs manifested no ill effects and showed no lesions of progressive tuberculosis when they were killed and examined *post mortem* 88 days later.

May 3, 1921. The suspension was again shaken in the shaking-machine for several hours.

May 4, 1921. Eighty-four guinea pigs, each weighing approximately 500 grams, received intra-abdominal injections of the suspension as follows: Six, $\frac{1}{16}$ cc each; six, $\frac{1}{8}$ cc each; and seventy-two, $\frac{1}{4}$ cc each.

The accompanying tables show when the sensitiveness to tuberculin was first manifest, the gradual rise in sensitiveness, and

TABLE 1. GUINEA PIGS INJECTED ON MAY 2, 1921, WITH KILLED TUBERCLE BACILLI SUSPENDED IN PHYSIOLOGICAL SALT SOLUTION.

Number of guinea pig	Dose of Suspension	Tested intra-dermally with tuberculin	Tested intra-dermally with beef broth*	Results
1	$\frac{1}{8}$ cc	May 12, 1921	May 12, 1921	Irritation caused by tuberculin greater than that caused by beef broth, but not sufficient to be termed a positive tuberculin reaction.
2	$\frac{1}{4}$ "	" " "	" " "	
3	$\frac{1}{2}$ "	" " "	" " "	
4	$\frac{1}{8}$ cc	May 17, 1921	May 17, 1921	Positive reaction to tuberculin. Beef broth—no reaction.
5	$\frac{1}{4}$ "	" " "	" " "	
6	$\frac{1}{2}$ "	" " "	" " "	

*Injections of tuberculin and beef broth were made simultaneously, the tuberculin being injected into the skin on one side of the abdomen, and the beef broth on the other side.

the period at which the sensitiveness reached its maximum.

The tuberculin used in this experiment was prepared in the Biochemic Division of the Bureau of Animal Industry, and each

TABLE 2. GUINEA PIGS INJECTED ON MAY 4, 1921, WITH KILLED TUBERCLE BACILLI SUSPENDED IN PHYSIOLOGICAL SALT SOLUTION.

Number of guinea pig	Dose of suspension	Tuberculin injected intra-abdominally	Dose of tuberculin per 500 grams weight	Results
7	$\frac{1}{4}$ cc	May 23	2 cc	Dead at 50th hour
8	"	"	"	Dead at 40th hour
9	$\frac{1}{4}$ cc	May 27	2 cc	Dead at 48th hour
10	"	"	"	Dead at 48th hour
11	$\frac{1}{4}$ cc	May 31	2 cc	Marked reaction; recovered
12	"	"	"	Dead at 21st hour
13	$\frac{1}{4}$ cc	June 3	2 cc	Dead at 18th hour
14	"	"	"	Dead at 40th hour
15	$\frac{1}{4}$ cc	June 6	2 cc	Dead at 22nd hour
16	"	"	"	Dead at 22nd hour
17	$\frac{1}{4}$ cc	June 8	2 cc	Dead at 20th hour
18	"	"	"	Dead at 20th hour
19	$\frac{1}{4}$ cc	June 9	2 cc	Dead at 17th hour
20	"	"	"	Dead at 17th hour
21	"	"	"	Dead at 17th hour
22	"	"	"	Dead at 17th hour
23	"	"	"	Dead at 18th hour
24	"	"	"	Dead at 17th hour
25	$\frac{1}{4}$ cc	June 9	$1\frac{1}{2}$ cc	Dead at 24th hour
26	"	"	"	Dead at 17th hour
27	"	"	"	Dead at 24th hour
28	"	"	"	Dead at 21st hour
29	"	"	"	Dead at 17th hour
30	"	"	"	Dead at 21st hour
31	$\frac{1}{8}$ cc	June 10	$1\frac{1}{2}$ cc	Dead at 24th hour
32	"	"	"	Marked depression; recovered
33	"	"	"	Dead at 24th hour
34	$\frac{1}{8}$ cc	June 10	2 cc	Dead at 20th hour
35	"	"	"	Dead at 20th hour
36	"	"	"	Dead at 24th hour
37	$\frac{1}{8}$ cc	June 10	$1\frac{1}{2}$ cc	Dead at 24th hour
38	"	"	"	Marked depression; recovered
39	"	"	"	Dead at 24th hour
40	$\frac{1}{8}$ cc	June 10	2 cc	Dead at 20th hour
41	"	"	"	Dead at 20th hour
42	"	"	"	Dead at 24th hour
43	$\frac{1}{4}$ cc	June 24	$1\frac{1}{2}$ cc	Dead at 21st hour
44	"	"	"	Dead at 21st hour
45	"	"	"	Dead at 21st hour
46	"	"	"	Dead at 21st hour
47	$\frac{1}{4}$ cc	June 27	1 cc	Dead at 22nd hour
48	"	"	"	No reaction
49	"	"	"	Dead at 22nd hour
50	"	"	"	Dead at 22nd hour
51	$\frac{1}{4}$ cc	July 11	1 cc	Dead at 16th hour
52	"	"	"	Marked depression; recovered
53	"	"	1 "	Dead at 16th hour
54	"	"	"	Dead at 16th hour
55	$\frac{1}{4}$ cc	July 25	1 cc	Dead at 32nd hour
56	"	"	"	Marked reaction; recovered
57	"	"	"	Slight reaction; recovered
58	"	"	"	Slight reaction; recovered
59	$\frac{1}{4}$ cc	July 26	1 cc	Dead at 16th hour
60	"	"	"	Dead at 16th hour
61	"	"	"	Dead at 21st hour
62	"	"	"	Marked reaction; recovered
63	$\frac{1}{4}$ cc	Aug. 8	1 cc	Dead at 28th hour
64	"	"	1 "	Dead at 6th hour
65	"	"	"	Dead at 22nd hour
66	"	"	"	Dead at 22nd hour
67	$\frac{1}{4}$ cc	Sept. 7	1 cc	Dead at 22nd hour
68	"	"	"	Marked reaction; recovered
69	"	"	"	Dead at 22nd hour
70	"	"	"	Dead at 22nd hour
71	$\frac{1}{4}$ cc	Nov. 21	1 cc	No reaction
72	"	"	"	No reaction
73	"	"	"	No reaction
74	"	"	"	Slight reaction; recovered
75	"	"	"	Slight reaction; recovered

cubic centimeter was the equivalent of 0.125 gram of Koch's Old Tuberculin.

The intra-abdominal injection of killed tubercle bacilli in guinea pigs usually results in a thickening of the omentum and the formation of from two to a dozen whitish tubercles, ranging in size up to three millimeters in diameter. These tubercles are found mostly in the omentum but may also develop on the capsules of the liver and spleen and on the peritoneum.

From the foregoing experiment it is evident that sensitiveness to tuberculin is caused in guinea pigs by the injection of killed tubercle bacilli.

During the period of greatest sensitiveness, with one exception, at least three out of every four guinea pigs died within 24 hours from the injection of smaller doses of tuberculin than are tolerated without inconvenience by normal guinea pigs.

Sensitization was first observed about two weeks after the injection of the dead tubercle bacilli. It increased gradually. At the end of four weeks, an injection of two cubic centimeters of tuberculin per 500 grams weight of guinea pig generally was fatal. At the end of the seventh week, an injection of one cubic centimeter of tuberculin per 500 grams weight usually was fatal.

The degree of sensitization is relatively stationary from the seventh to the eighteenth week. The exact time at which it begins to decline was not determined. No injections were made between the eighteenth and twenty-eighth weeks. At the twenty-eighth week, a marked decline was apparent.

NOTE—In connection with the foregoing experiment it is interesting to record that with tests made at the Experiment Station some time ago it was found that guinea pigs may also be sensitized for tuberculin by subcutaneous injections of dead tubercle bacilli, even when the doses of such tubercle bacilli are too small to cause more than a slight induration at the seat of injection. Cattle injected with small doses of dead tubercle bacilli, occasionally, but not invariably, react with tuberculin afterwards.

For example, among a group of nine cattle which had received small doses of dead tubercle bacilli suspended in tuberculin, two reacted with the intradermic test about two months later, one with the subcutaneous test and none with the ophthalmic. The animal which reacted with the subcutaneous test was one of the two which reacted with the intradermic, and this animal killed and examined *post mortem* six weeks after the tuberculin tests were made, failed to show lesions indicative of tuberculosis or any other disease.

The periodic tests of commercial tuberculin made at the Station, taking the results of this work into account, now include careful studies of samples with regard to the degree of their contamination with dead tubercle bacilli. Formerly dead tubercle bacilli were quite common and abundant in some samples and practically absent from others, justifying the conclusion that it is not economically difficult to have all samples of tuberculin practically free from dead tubercle bacilli. Since then a great improvement in this respect has been effected in the tuberculin prepared and sold in the United States under Government license.

E. C. SCHROEDER.

Superintendent of Experiment Station.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

POLYARTHRITIS AND RACHITIS IN CALVES

By D. D. Baker,

Ames, Iowa.

Senior Veterinary Student, Iowa State College

History:—Grade Holstein bull, one year of age, entered the hospital on February 6, 1923, with the following history: There are eleven in the herd, all about the same age; one has died and three others are in the same condition as this animal; aged cattle in good health. The first symptoms were noticed about six months ago, when knee and pastern joints seemed swollen and stiff; diarrhea developed, followed by constipation and loss of appetite.

Symptoms:—This animal showed slight increase of respirations and pulse, loss of appetite, marked emaciation, depression, constipation; small frame and large coarse head, indicating a stunted growth; general stiffness, avoiding movement; usually recumbent; buck-kneed standing-position, enlarged joints, and extremities of bones enlarged.

Tests:—Animal was placed on a ration consisting of middlings, oats and alfalfa hay. The subcutaneous and intradermal tests for tuberculosis were given with no reaction. Sodium salicylate 1 ounce was given *b. i. d.* over a period of four days before post mortem. Blood count showed 20,000 leucocytes and 4,000,000 red cells, indicating a slight leucocytosis and quantitative anemia.

Autopsy:—The animal had been entered for diagnosis by a nearby practitioner who wanted the calf posted. This was done on February 20. No improvement was noticeable which could be credited to the two weeks of treatment. The post mortem findings were as follows: Hair mixed in rumen contents, petechiae on mucous membrane of intestine, with a catarrhal gastro-enteritis present, spleen pale, mesenteric lymph glands hyperemic, joint cavities of the stifles contained bloody synovia, extremities of long bones enlarged and cartilaginous, shafts relatively soft

and chalky, articular cartilages slightly eroded, petechiae and ecchymotic hemorrhages in marrow of femur and tibia.

Microscopic examination of the bone revealed no organisms responsible for the hemorrhages.

Diagnosis:—The condition, no doubt, was a nutritional disturbance and a diagnosis of rachitis and polyarthritis was made. As gastro-enteritis is common in either of these conditions it would be necessary to have more definite history to say whether it was a primary or secondary condition. The lesions present in the intestine were not severe enough to indicate a primary condition.

It is thought that this condition has been mistaken by some for rheumatism in calves. It might be said that a similar case in the hospital, a Holstein calf from another herd, in which several were affected, is showing slow improvement on a treatment of syrup of hypophosphites 1 ounce, *u.i.d.*, a ration of corn, oats, bran and alfalfa hay, with plenty of exercise.

SCIENTIFIC OBSERVATIONS

In the *San Francisco Chronicle*, Burt Davis, scientific farmer, of San Leandro, has found that scopolamin, the noted truth-drug, does not always work with animals but on the contrary makes colossal liars out of them.

A week ago he began to experiment. The inoculation of an honest sheep dog made it back into the shaft of a wagon and wait for the harness. A hen, given the needle, climbed from a nest of eggs and crowed. Two hogs that had been hogs all their lives mewed like cats when given a shot.

According to Davis, the only one on the farm who responded to the drug was Mrs. Davis, who, after an inoculation, told her husband exactly what she thought of married life. Davis called off the test.

A GOLDEN OPPORTUNITY

I was much interested in your recent editorial on "Pediculosis—Chiropractically Speaking," particularly B. J.'s remarks on scavengers attracted my attention, and in this connection I would like to inquire whether there are any Chiropractic Veterinary Surgeons, as my dog is greatly annoyed by a kind of scavenger called "fleas," and if adjustment would help him, I want him adjusted.

C. S.

From *Tonics and Sedatives*, Journal A. M. A.

REVIEW

BERGEY'S MANUAL OF DETERMINATIVE BACTERIOLOGY. (Arranged by a committee of the Society of American Bacteriologists, of which Dr. David H. Bergey is chairman.) 442 pages. Published by Williams and Wilkins Company, Baltimore, 1923.

Since Professor F. D. Chester, over twenty years ago, published his "Determinative Bacteriology," there has not been available to workers in the field of bacteriology any up-to-date manual to which to refer in the study and identification of microorganisms of the class schizomycetes.

Appreciating the need for a work of this kind and following up the work done by the committee on characterization and classification of the Society of American Bacteriologists, this key for the identification of species has been compiled. As stated in the preface, the Committee does not feel that the classification here offered is to be accepted as final, but more in the nature of a report of progress that may lead to a more satisfactory classification at some future time.

In examining the book the one feature most conspicuous by its absence is a cross-index of the old and new names. Only after quite a search were we able to locate old friends, listed in this new manual under their latest names only. Even after locating some of these organisms we find that in many cases few or no synonyms are given. That it was not the intention of the compilers to omit synonyms entirely is evidenced in the case of the colon organism, which we found hiding as *Escherichia coli*.

Many of the genera adopted in the new classification are new, and in view of the custom of abbreviating the name of the genus, in writing names, it would appear advisable for a definite form of abbreviations to be adopted. Perhaps this has been done elsewhere, but there appears to be no reference to it in this work.

We note that McGowan is credited with the discovery of *Alcaligenes bronchisepticus* (formerly *Bacillus bronchisepticus*) as the cause of canine distemper. This credit should go to Ferry whose preliminary report in the *American Veterinary Review* (1910) was prior to any publication by McGowan on the subject. Under habitat, no mention is made that this organism has been found associated with numerous distemper-like affections of other animals by various investigators.

One of the most astonishing bits of information in the book is found in the key to the species of the genus *Pasteurella*. Here is what bacteriologists have been trying to find for many years, a means of differentiating the members of this most interesting group. We note that the growth in milk and on potato serves to distinguish the bovine, porcine and lepine from the avian and rodent organisms. While this is good news, we hesitate to recommend it as a safe basis for differentiation.

The book represents a vast amount of work, but as is so often the case with first editions, it is replete with inaccuracies, which will undoubtedly be corrected in future editions. The value of the book will be materially enhanced thereby.

ABSTRACTS

AN INFECTIOUS OPHTHALMIA OF CATTLE. F. S. Jones and Ralph B. Little. Jour. Exp. Med. XXXVIII (1923), 2, p.139.

The authors made a bacteriological study of twenty-four cases of infectious ophthalmia which occurred in a dairy herd. A diplobacillus was isolated from every case. The morphology and cultural characteristics of this organism are so similar to the Morax and Axenfeld diplobacillus, which is the cause of human pink-eye, that the two may prove to be identical. Zinc sulphate is apparently a specific in the treatment of infections with the human and bovine diplobacillus. A 1-40 solution of zinc sulphate was employed. The disease was reproduced experimentally with the diplobacillus. The authors have tersely summarized their observations as follows:

"Twenty-four cases of an acute ophthalmia of cattle have been observed. The infection is characterized by photophobia, severe congestion of the vessels of the eyeball, conjunctivitis, congestion and edema of the membrana nictitans, edema of the eyelids, accompanied by a thick, yellowish-white, mucous or mucopurulent exudate. In certain cases corneal ulcers and extensive corneal opacities developed. From all cases a characteristic diplobacillus was obtained. The organism was usually observed in the exudate in large numbers. The morphology, the hemolytic properties and the proteolytic activities readily assist in its identification. Instillation of a few drops of bouillon suspension of pure cultures beneath the eyelids on normal cattle gave rise to characteristic inflammations. The organism is not pathogenic for laboratory animals.

F. B.

A COLLECTION OF NEMATODE PARASITES FROM ZANZIBAR.

C. L. Boulenger. Parasitology (Cambridge, Eng.), xv (1923) 2, pp. 113-121, text figs. 1-5.

The worms reported are from both domesticated and wild animals. Those reported from domesticated animals include *Belascaris cati* from the cat, *Belascaris marginata* from the dog, *Oxyuris equi* from the donkey, *Ascaridia lineata* from the chicken, *Strongylus vulgaris* and *S. edentatus* from the donkey, *Oesophagostomum columbianum* from sheep and goats, *O. dentatum* from the pig, *Haemonchus contortus* from sheep, *Physaloptera praeputialis* from the cat, *Setaria equina* from the donkey, *Setaria labiatopapillosa* from the ox, and *Trichuris ovis* from the sheep. *Ascaridia hamia* Lane, 1914, is regarded as a synonym of *A. lineata*. *Physaloptera praeputialis* is redescribed and figured. The specimen of *Setaria labiatopapillosa* is labelled by the collector as from the "heart of ox."

M. C. H.

BACILLARY DYSENTERY IN LAMBS. A NOTE ON SOME RECENT RESEARCH INTO THE ETIOLOGY AND SOURCE OF INFECTION. Gaiger, S. H. and Dalling, T. Jour. Comp. Path. and Thera. xxxvi (1923), p. 120.

The article is a continuation of the studies published in 1921. At that time they believed that lamb dysentery was due to an organism of the *B. coli* type. More complete studies have led them to conclude that two organisms are responsible, *B. coli* and an anaerobe of the *B. welchii* type. They state that infection takes place by ingestion during or after birth. The soil becomes contaminated and harbors the organism from year to year.

F. S. J.

SOME POINTS RELATING TO THE MORPHOLOGY AND DEVELOPMENT OF SARCOCYSTIS TENELLA. J. P. McGowan. Parasitology (Cambridge, Eng.), xv (1923), 2, pp. 139-150, text figs. 1-2.

A disease affecting sheep in Scotland and known as scrapie, characterized by itching and paresis, is regarded as due to a heavy infection with *Sarcocystis tenella*, probably of increased virulence. The parasite is said to be transmitted from sheep to sheep by intrauterine infection and by means of the milk.

M. C. H.

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Sixtieth Annual Meeting, Montreal, Canada. August 27 to 31, 1923.

(Continued from p. 111, October Journal)

MONDAY AFTERNOON, August 27, 1923

The meeting convened at 3:00 p. m., President Welch presiding.

PRESIDENT WELCH: The first thing on the program is a report from the Executive Board

. . . . Secretary Hoskins read the report.

DR. MAYO: In considering the Executive Board report, I believe it would save time if we act upon the different sections of the report as they are presented.

SECRETARY HOSKINS: The first recommendation that requires action by the Association is one relative to donating JOURNALS to the War Memorial Library of the Royal College of Veterinary Surgeons, London, to enable them to complete their files. The Executive Board recommends that the Association donate copies of the JOURNAL as far as our reserve files will permit.

DR. MAYO: I move that the Association approve the recommendation of the Executive Board.

. . . . The motion was seconded and carried.

SECRETARY HOSKINS: The next item is in regards to our Relief Fund. I might say that \$200 has been paid, during the past year, from our Relief Fund, to Dr. B. M. Goodman, and a recent communication indicates that Dr. Goodman is in need of further assistance. It was voted, on motion of Dr. Munce, seconded by Dr. Hilton, that this matter be referred to Dr. Way, who is a member of the Budget Committee, and to work it out with the Budget Committee.

It was not felt, by the members of the Executive Board, that we are proceeding along safe lines in continuing to give relief from this fund, for fear that the wrong interpretation may be placed upon the purpose of the fund or upon the functions of the Association.

DR. MAYO: Mr. President, in this connection, is this recommendation or action open for discussion?

SECRETARY HOSKINS: There is no recommendation, but I believe it is in perfect order for the matter to be discussed.

DR. MAYO: In previous years, by action of the Association and Executive Board, the President and Secretary were made the Committee to distribute what relief was deemed necessary and I still believe that that matter should be handled through the President and Secretary, with the Treasurer or any others, who may be interested, but the point I wanted to make is that the President and Secretary are already authorized to consider these applications.

SECRETARY HOSKINS: I might say that we have made no change in that policy and Dr. Welch and I have continued to function as the custodians of this fund. We have drawn the vouchers on this fund and they have been honored by Treasurer Jacob, but the point is this: This fund is rapidly being depleted, and at the present time, there is absolutely nothing being done to replenish the fund or even to keep it up to a certain amount.

The second point is that it is the belief of a number of the officers of our Association that no impression should get out that our Association is in any way a beneficial organization, and that is the reason it was deemed advisable to proceed with caution, with regard to any further withdrawals from this fund.

DR. MAYO: Mr. President, I would just like to say another word. This fund, as most of you know, was started during the war, and it was started with the object of giving immediate and only temporary assistance to veterinarians or their families who were in temporary need. It was not started, so far as I recall, with the object of providing a permanent relief fund that should continue for any particular length of time or any indefinite length of time, but only to just tide over an immediate emergency. I also believe that before the Association should adopt a plan of continuing relief for years, to any individual, it should be brought before the Association, and the Association decide what action should be taken.

PRESIDENT WELCH: Do you want to act on that at the present time? What is your pleasure?

DR. MAYO: In order to get an expression of opinion, I move that the Relief Fund of the American Veterinary Medical Association shall be for the sole object of affording temporary relief for members, or their families, who may be in need.

. . . The motion was seconded. . . .

PRESIDENT WELCH: Gentlemen, you have heard the motion. Is there any discussion on the subject? I will ask Dr. Hoskins to explain this Goodman matter.

SECRETARY HOSKINS: Dr. B. M. Goodman is a veterinarian in the employ of the Bureau of Animal Industry. He is on the force at Cincinnati, Ohio. A little over a year ago he was taken seriously ill with diabetes. His savings were very rapidly exhausted and he was in dire need of financial assistance. A communication was addressed to the Association, asking for some financial assistance. After considerable correspondence and thorough investigation of the worthiness of the case, the President and the Secretary agreed that Dr. Goodman should be given one hundred dollars from our Relief Fund, which was done. A very nice letter of appreciation was received.

We kept track of the case and a very short time after that, Dr. Goodman was placed on insulin treatment. He responded very nicely and was thought to be on the road to recovery. He had a setback and a second request from the same source, through the same channels, was made upon our Association, or our Relief Fund, for further assistance, which was granted.

This third request was received just a very short time ago, and is practically the same sort of a request as the first and second. Dr. Goodman is not doing very well; some complications have set in, and he is in very sad circumstances.

There are twenty-seven hundred and some odd dollars in the fund, and we have withdrawn \$200 during the past year and transmitted it to Dr. Goodman.

The third request, which is now on file, has not been acted upon, and that is the one now under discussion.

DR. MUNCE: As a member of the Executive Board, I would like to make known the following facts which confronted the Executive Board.

This fund was created primarily to take care of an emergency situation during the war. Since the war, as you all know, conditions have changed. Now, this is the situation: since the war has closed, there have been two cases provided for, from this fund, by the Executive Board, and as Dr. Hoskins says, the third application was presented yesterday.

The Executive Board, after careful consideration, felt that they should proceed cautiously in this matter of giving relief to members of the Association, or the families of deceased members, because we were establishing a precedent which might lead us into deep water and would be dangerous.

Therefore, we felt the matter should come before the Association for the purpose of having a definite policy established by

the Association, along the line of giving relief to needy members or their families. This is the purpose of presenting it at this time.

DR. MAYO: Mr. President, I am not discussing the merits of this case which Dr. Hoskins presented; I am discussing only the question of policy that the Association should follow. I believe that unless the Association adopts some plan or method of establishing a permanent relief, insurance or whatever you may call it, the principal of this fund should remain unimpaired in the Association treasury.

I think the relief given in any year ought not to exceed the income from this fund; that is, under the present circumstances.

Mr. President, I would like to make an amendment to the motion, that the sum expended in any one year shall not exceed the income received from this fund.

Seconded by Dr. H. W. Wilson.

PRESIDENT WELCH: As many as are in favor of the amendment say "aye"; opposed, "no." The amendemnt is carried.

Secretary Hoskins then read, in the Executive Board report, the paragraph relating to Dr. Wm. C. Woodward's several letters, requesting that the American Veterinary Medical Association work with the American Medical Association on certain legislation.

SECRETARY HOSKINS: Just a word about the nature of these communications, from Dr. Woodward, who is Executive Secretary of the Bureau of Legal Medicine and Legislation of the American Medical Association. One of them is that under the present rulings of the proper authorities, physicians, veterinarians and other professional men are not allowed to make deductions in their income tax reports for any expenses entailed in attendance at meetings, a convention of this kind, for instance, or in pursuing post-graduate courses, and it is the thought that these expenditures are legitimate expenditures, made in a business way, and should be deductible.

The second communication favored a reduction in the present narcotic license fee, from three dollars to one.

The third communication was soliciting the support of this Association for the protection of medical research, with particular regard to humane measures and vivisection questions. The communication from Dr. J. P. Turner, which is closely all ed, being of a legislative nature, is that at the present time it appears to be absolutely ridiculous for veterinarians to be limited to two gallons of alcohol a year, when the same amount is allowed to

dentists, and the only use that a dentist ever has for alcohol is in annealing gold, and it is believed that veterinarians could legitimately use a considerably larger amount than the present allotment. There is no recommendation.

Secretary Hoskins reported that a communication had been received, inviting the American Veterinary Medical Association to send a representative to the Centenary Anniversary of the Royal (Dick) Veterinary College, Edinburgh. The Executive Board recommended to the Association that Dr. W. H. Wray be appointed our official delegate to represent the Association at the celebration November 27th and 28th, 1923. The Secretary reported that Dr. Wray had been a member of the Association for forty-five years, and was at present located in England, and that it was believed that he was the logical person to act in the capacity of our representative at the centenary celebration.

DR. GEORGE H. BERNES: If I am not mistaken, I think I saw in a paper not long ago that Dr. Wray had passed away.

DR. JOHN R. MOHLER: Mr. President, I want to ask if any provision has been made for the payment of Dr. Wray's expenses by this Association?

SECRETARY HOSKINS: Dr. Bernes reports that the Brooklyn papers recently contained a notice of the death of Dr. Wray. Can anyone vouch for the correctness of this report?

DR. CHAS. H. HIGGINS: The death notice was in the New York papers last Wednesday or Thursday.

DR. N. S. MAYO: I am in favor of having a representative at that meeting if we can do so without too much expense, and if we have a member in England who is available to represent this Association at the meeting, I should be very glad to make a motion that this Association pay the expenses of such member to attend this meeting as a representative of this Association.

The motion was seconded by Dr. Kinsley.

DR. MAYO: I wish it to be understood that we will not pay the expenses of a member from this country, but of a member who may be in England at the time.

DR. MOHLER: Does the motion carry the name of Dr. Wray? Dr. Tuck, of New Orleans, has been ordered to go to London. Dr. Wray is almost seventy years of age. He goes on the retirement list in January 1924. The Bureau has provided to have Dr. Tuck in London in time to get some instructions, so I would prefer not to have any name mentioned. In case Dr. Tuck is

there, he can attend the meeting as a representative of this Association.

President Welch then put the motion, which was carried.

The next order of business was the admission of new members. The Secretary read the list of applicants who had been approved by the Executive Board. (The complete list of new members admitted at this meeting will be published in another part of the proceedings.)

PRESIDENT WELCH: Gentlemen, these applications have been approved by the Executive Board. What is your pleasure? A motion to elect them to membership will be in order.

DR. MAYO: I move that the names read be elected to membership, and the Secretary instructed to cast the ballot of the Association for those whose names were read.

The motion was seconded and carried. Secretary Hoskins cast the ballot, as instructed, and the applicants were declared elected to membership.

SECRETARY HOSKINS: There are several applications that will have to be taken care of by special action. We have four applicants who are graduates of the United States College of Veterinary Surgeons, in Washington, D. C. This college was not recognized at the time that these four applicants graduated. The applicants have been out of college five years, but we are informed that the college is still continuing to graduate veterinarians not in conformity with the requirements of this Association. The Executive Board, therefore, recommends that these four applicants be not accepted.

DR. MAYO: I move that the action of the Executive Board be approved.

The motion was seconded and carried.

SECRETARY HOSKINS: We have one applicant who is a graduate of the Arkansas Veterinary College. The Executive Board recommends that this applicant be not accepted.

DR. T. H. FERGUSON: I move that the action of the Executive Board be approved.

The motion was seconded and carried.

SECRETARY HOSKINS: We have the application of Dr. George R. White, of Nashville, Tennessee, held over from last year. This application was presented last year, and some question was raised concerning the applicant, who was requested to appear before the Executive Board and make his application in person. Dr. White failed to appear last year, and has not appeared this

year, hence the action recommended; namely, that this application be not accepted.

DR. J. T. HERNSHEIM: I move that the action of the Executive Board be approved.

The motion was seconded and carried.

SECRETARY HOSKINS: We have two applicants, Dr. T. F. Lane, of Ann Arbor, Michigan, and Dr. J. F. McGhee, of Chamberlain, South Dakota, both graduates of the Western Veterinary College. The Executive Board recommends that these two applicants be accepted under a suspension of the by-laws. The reason for this action is that the Western Veterinary College was not approved by this Association. It is no longer in existence, and these two applicants come to us extremely well recommended. I personally am acquainted with Dr. Lane and can recommend him without reservation. I have letters on file relative to the other applicant, Dr. McGhee, and as far as it is possible to learn, he is a veterinarian in good professional standing in his state. The Association has already adopted the precedent of admitting graduates of this institution, on a number of occasions in the past. Dr. Lane is a member of the Michigan State Veterinary Medical Association, and I believe I am correct in saying that Dr. McGhee is a member of his State Association.

DR. KINSLEY: Mr. President, a question of information. Each of the members, as I recall it, who were elected from the Western Veterinary College, was elected on personal recommendation. What is the difference between these men and the one from the Arkansas Veterinary College?

SECRETARY HOSKINS: The only difference, so far as I know, is that the precedent has already been established in the case of the Western Veterinary College.

DR. KINSLEY: I would like to know if there are any personal recommendations for the gentleman from Arkansas. Who turned in his application?

SECRETARY HOSKINS: I did. I attended the annual meeting of the Arkansas Veterinary Association, in Little Rock, on June 9th. While there, I became acquainted with Dr. Noffsinger, who subsequently filed his application at my earnest solicitation. At the time that I approached him on the subject I believed that it would be possible for him to be admitted to membership under Section 3 of Article 2 of the by-laws, which provides that veterinarians who are graduates of institutions that were not recognized by this Association at the time of their graduation,

after a lapse of five years, may be admitted to membership in this Association provided that the institution in question has ceased to graduate veterinarians in violation of our requirements, and I believed at the time that I solicited this man to put in his application, that he could be taken in under that clause in the by-laws.

I personally investigated the standing of this man. He is one of those exceptional individuals who would undoubtedly have been a good man no matter where he went to college. He was just unfortunate enough to have connected himself with the institution in question. He enjoys a very lucrative practice in his community; is a very highly respected citizen; is a member of his State Association; and his professional standing, as far as I could ascertain, is of the best. Dr. H. W. Wilson, our Resident Secretary for Arkansas, is in the room and if he cares to say anything concerning this application I dare say you will extend him that privilege.

DR. H. W. WILSON: In times past it has been customary, on a few occasions, where men were not graduates of schools recognized by this Association, to accept their applications and admit them to membership. I remember a case of that kind last year, and also the year before. This particular man is just as Dr. Hoskins says, one who, I believe, would be a credit to the Association, and it is pretty hard to tell where to draw the line. Personally I would recommend him.

DR. FERGUSON: It seems to me that we have here the cases of three different men who have proven to be good men in the profession, regardless of the fact that they selected poor schools to attend. They have all been out in practice five years or more, and they come well recommended. I believe we would be wise in giving their cases favorable consideration.

DR. KINSLEY: I move that we approve the recommendation of the Executive Board relative to the two applicants from the Western Veterinary College.

SECRETARY HOSKINS: The motion is to adopt the recommendation of the Executive Board and admit to membership in this Association, under suspension of the by-laws, Dr. T. F. Lane, of Ann Arbor, Michigan, and Dr. J. F. McGhee, of Chamberlain, South Dakota, graduates of the Western Veterinary College.

PRESIDENT WELCH: Gentlemen, this will require suspension of the by-laws.

DR. C. S. CHASE: I do not see how you can admit those from one school and not from the other. If you admit these two men you will have to admit the one from Arkansas as well.

DR. KINSLEY: It was my idea to ask for a reconsideration of the other motion. We will have to dispose of the one that is before us first.

President Welch put the motion to elect the two applicants from the Western Veterinary College, which was carried.

DR. KINSLEY: Mr. President, I move that we reconsider the question of the applicant from Arkansas.

The motion to reconsider was seconded and carried.

DR. KINSLEY: Mr. President, I move that the rules be suspended and the Secretary instructed to cast the ballot of the Association in favor of the applicant from Arkansas, electing him to membership in this Association.

The motion was seconded and carried.

SECRETARY HOSKINS: We have several applications from veterinarians located in foreign countries. Among them are four applications from graduates of the veterinary college located in Cairo, Egypt. The Executive Board recommends that these applications be referred to the Committee on Intelligence and Education, for a recommendation. There is also an applicant from Cuba, Major Luis A. Beltran.

DR. MAYO: Mr. President, I move that the action of the Executive Board be approved and the Secretary instructed to cast the ballot of the Association for Major Beltran.

The motion was seconded and carried.

SECRETARY HOSKINS: We have an application from Mexico, that of Dr. Carlos Pavia E.

DR. MAYO: Mr. President, I know Dr. Pavia personally, and he is a very fine gentleman. I believe that in considering the name of a foreign veterinarian we should give it careful consideration from the standpoint of policy. I believe that this Association is destined to be, if it is not already, one of the greatest veterinary associations in the world. One of the things that I feel proud of in my career as a veterinarian is that I believe I was instrumental in getting the Association to adopt an official JOURNAL.

Now, our JOURNAL goes to veterinarians in other countries, and I believe that it is carrying the message of this Association to other countries, and I believe it should be the policy of this Association to extend its work, to make it international in char-

acter just as far as possible, and I also believe that this Association should endeavor to secure membership in other countries just as much as we can. I believe that it will redound to the prosperity, the usefulness and the efficiency of this Association. We have already accepted members from Mexico. I do not know but that we have more than one from the National Veterinary School, of Mexico. I believe that we should establish the policy of recognizing, as eligible to membership in this Association, graduates of state or national veterinary schools, particularly national veterinary schools of other countries, and I, therefore, am much in favor of the motion to elect Dr. Pavia to membership.

DR. BENNETT: I will sanction what Dr. Mayo has said. I have had the pleasure of meeting Dr. Pavia, in Mexico, and know him to be an honorable gentleman.

DR. KINSLEY: I move that the action of the Executive Board be approved.

The motion was seconded.

PRESIDENT WELCH: You have heard the motion, that the report of the Executive Board be approved, and that Dr. Pavia be elected to membership.

. . . The motion was carried. . . .

SECRETARY HOSKINS: That disposes of the irregular cases.

DR. MAYO: How about those applications from Egypt?

SECRETARY HOSKINS: There are five altogether. One of the five is a graduate of the Royal College of Veterinary Surgeons and was not questioned. The other four are graduates of the Cairo Veterinary College, and they have been referred to the Committee on Intelligence and Education for further enlightenment, as it was the belief of the members of the Executive Board that the Committee on Intelligence and Education had received instructions to make some investigation and study of foreign colleges whose graduates we might accept at any time that they sought admission to this Association.

DR. MAYO: I would like to ask another question. Who sent in these names from Egypt?

SECRETARY HOSKINS: The names were sent in by the Resident Secretary of Egypt. The Resident Secretary of Egypt is a member of this Association and was accepted as a member of this Association as a citizen of Egypt.

DR. MAYO: Do you know of what school he is a graduate?

SECRETARY HOSKINS: He is a graduate of the Ontario Veterinary College.

DR. MAYO: Mr. President, I think the Secretary is wrong with reference to the Committee on Intelligence and Education. The Secretary of the Association was instructed, a couple of years ago, to collect data in regard to these foreign veterinary schools, and I wrote to all that I could learn of, but there were a good many I didn't know about, and I confess my ignorance. The National Veterinary School, of Cairo, Egypt, was one, but I believe these men are entitled to membership in this Association. They have been proposed and recommended by a graduate of the Ontario Veterinary College, who is a resident of Egypt, and I believe a native of that country, and I move that the Secretary be instructed to cast the ballot of this Association in favor of those applicants from Egypt.

DR. CARY: The Constitution and By-laws makes no provision for Europeans, except as honorary members of this Association; or for Asiatics. I rise to a point of order, to object to the reception of these members, on the grounds that it is not constitutional.

SECRETARY HOSKINS: I perhaps am again to blame, to some extent, at least, for these applications from Egypt being presented. When it devolved upon the President to appoint his resident secretaries last fall, at his request, I submitted to him the names of members located in certain states, and with it I included a list of foreign countries, where we had members.

We had a member in China, and to the best of my knowledge he was accepted at the time that he was a citizen of China. We have members in quite a number of countries in South America. We accepted a member, at the meeting last year, from the Dominican Republic; we have members in Cuba; we have accepted members who were located in England at the time of their admission to this Association, and to me, it looked like splitting hairs to say that it was all right to admit a Chinaman and turn down an Egyptian; so I included the name of Dr. Aghion, as a possible resident Secretary for Egypt, along with the possible resident secretaries in other countries, where we had members in good standing.

I never expected that Dr. Aghion, who is the Egyptian Resident Secretary, would turn in any applications but lo and behold, one day I got a letter from Cairo that was plastered, front and back, with stamps, much to my delight, and on opening it, I

found a remittance for fifty dollars, covering these five applications for membership.

They were acknowledged in the usual way, and the applicants were told that their applications would be presented to this Association at this meeting; and I might say, as I told the Executive Board yesterday afternoon, I have been using this little incident as an argument in soliciting new members for our Association. I have told the men, in a number of states, that it was hard for me to understand how five men, away off in Egypt, could see sufficient value in paying their money to join our Association, when the chances are they would never get anything out of it except the JOURNAL, and yet we had between two and three thousand eligible veterinarians in this country who couldn't see the good of joining our Association.

DR. KINSLEY I would like to ask Dr. Cary to read us from the Constitution. As I see it, "Members of this Association shall be of two kinds, active and honorary. Active members must be graduates of veterinary colleges approved by the Association and recommended by the Executive Board and elected to membership in accordance with the by-laws."

DR. CARY: Mr. Chairman, it is easily explained. Our very title says, "*American Veterinary Medical Association.*" Does American mean Egypt, England, China, India? If I am wrong, you had better put that in the Constitution and By-laws.

DR. MAYO: Mr. President, after all, it is just a question of name. We have members in Japan. We have quite a good many members in the Philippines, in England, in France, in Egypt, in Africa, and I confess that this is the first time that I have ever heard the question raised that no one could belong to this Association unless he happened to be located upon the Americas.

DR. CARY: As long as there has been a violation of the Constitution and By-laws, there is no reason why we should continue.

DR. MAYO: We haven't violated the Constitution and By-laws. It provides that we can elect members in certain ways and doesn't say from what country they shall come.

DR. MURPHEY: I want to relate one instance. The American Association of Anatomists publishes a journal. The Secretary sent this publication to all parts of the globe. He solicited private contributions to do this. The result was a great increase in the prestige of the American Association of Anatomists in the eyes of the anatomists of the world.

I know that while Dr. Mohler was Editor of this Association, he followed a very similar policy, in sending the official JOURNAL of this Association to all corners of the globe, and I am sure that that added prestige. I am sure that taking in these members, even stepping over technicalities in the constitution, would add prestige to the Association. It is an honor to us to accept those applicants from foreign countries.

PRESIDENT WELCH: I will say, gentlemen, I think there is no ground for questioning any individual in any part of the world, who desires to become a member of the Association.

DR. B. T. SIMMS: I feel that we are making a mistake when we admit any man to our Association unless we know something of the qualifications, regardless of whether he lives in Timbuctoo or in Montreal. We know nothing of this veterinary college from which these men are graduates. If we exclude our American citizens, because they have graduated from schools that have not been inspected and have not passed the requirements of our Association, it seems to me we should not admit foreigners until they have come up to our requirements and qualifications.

For that reason I am very much opposed to admitting any man to our Association who has graduated from some school concerning which we have no information. Our former Secretary admits he had not even heard of this school until it came before us just now. I think that is true of practically every man in this room. For all I know, that may be a correspondence school, and I dare say that will hold with ninety-nine per cent of them.

If we have requirements for American applicants, let's hold those same requirements up for foreigners, and until we know something of the school from which they come, I am very much opposed to admitting these men to membership in our Association.

DR. MAYO: Mr. President, I think that there is a very decided difference between those in this country who are in actual practice, and those in foreign countries who have graduated from recognized—I say recognized and I mean by that, official schools in those countries. In the first place it is a very difficult matter to compare our system of education and our curricula in the schools of this country with those of other countries. The environments are very different. Unfortunately, a good many of us from just south of the line have an opinion that there is nothing in the world like what we have in the States; no

veterinary schools in the world can compare with ours, we have the biggest, and so on.

Maybe that is a natural inference, but after all, I want to tell you, there are some good veterinary schools in the world besides what are in the United States, and there are some good men graduating from them, too.

This Association has recognized schools, foreign schools, that according to our standards it would be pretty hard to compare. There are a number here that know Dr. Aghion and know that he is a first class man. I would have no hesitation whatever in accepting his judgment in recommending these men for membership.

Unfortunately, the argument which the Doctor presented about recognition in the United States has been due to our own ignorance, and our own lack of organization in the States because we have veterinary schools all the way from a blacksmith shop up to a university, and we had to make some distinction. Other countries, I believe, are very far ahead of us in the question of veterinary education, and when they have established official veterinary schools in a country, it means that the school meets the requirements of that country, and I believe we should not be so provincial as to measure everything by what we happen to have in the United States. (Applause).

PRESIDENT WELCH: You have heard the motion that these veterinarians be elected to membership.

. . . The motion was carried. . . .

SECRETARY HOSKINS: I hereby cast the ballot of the Association for all of these veterinarians whose applications have been given special consideration, in conformity with your several instructions.

PRESIDENT WELCH: Gentlemen, I have just received the following telegram:

"President Congres Veterinaires,

Mount Royal Hotel, Montreal, Que.

Mon premier soin débarquant New York est vous prier
presenter cordial salut representant France a tous nos
confreres.

Professor Porcher Delton."

(Translation)

"Veterinary Convention,

Mount Royal Hotel, Montreal:

My first thought upon disembarking in New York is to present cordial greetings from France to all our confreres.

Professor Porcher."

(Applause.)

We will now hear the report of the Secretary-Editor.

. . . Secretary Hoskins presented his prepared report.

. . . (Applause.)

PRESIDENT WELCH: Gentlemen, you have heard the report of the Secretary-Editor. What is your pleasure? .

. . . It was voted, on motion of Dr. Mayo, duly seconded, that the report be accepted and referred to the Executive Board.

. . . (The report of the Secretary-Editor will be published in the December JOURNAL).

PRESIDENT WELCH: The report of the Treasurer?

TREASURER JACOB: Mr. President, and Gentlemen: As has been the custom in the past the report covering our finances has been prepared in pamphlet form. I have distributed this among you, and it gives in detail all the information pertaining to the office.

If there are any of you here who have not a copy of it, and desire to have one, let your wants be known and you will be supplied with it.

I might state in this connection that I consider our financial status at the present time as being very healthy, from a comparative standpoint, I should say. At the end of the fiscal year we had practically as much money as we had at the end of the previous fiscal year, and this in spite of the fact that there has been a change in the Editor and the Secretary, and the changing of the office, in that connection has always been a very expensive proposition, but as I say, in spite of that, we have got practically as much money as we had last year.

PRESIDENT WELCH: What shall be done with this report?

DR. MAYO: I move it be accepted and referred to the Executive Board.

. . . The motion was seconded and carried. . . .

SECRETARY HOSKINS: Mr. Chairman, I have here two rather short reports that are listed to be presented later in the meeting, and it is always a good thing to save time, if that can be done.

I am wondering if you would care to have presented at this time a very brief report of the Committee on History and the report of the Committee on Anatomical Nomenclature.

DR. KINSLEY: I move that the Secretary read these reports at this time.

. . . The motion was seconded and carried. . . .

. . . Secretary Hoskins read the report of the Committee on History. . . .

. . . It was voted, on motion of Dr. Kinsley, seconded by Dr. Mayo, that the report of the Committee on History be received, and the Committee continued. . . .

. . . Secretary Hoskins then read the report of the Committee on Anatomical Nomenclature. . . .

. . . It was voted, on motion of Dr. Mayo, seconded by Dr. Kinsley, that this splendid report be received. . . .

DR. MERILLAT: It seems to me that there is a reflection on the past officers of this Association in this report. I hope it isn't written into the records of this body. I can't recall where any officer of this Association ever was accused of being dilatory in his duties, and I don't think it is proper for us to let this go on record.

PRESIDENT WELCH: It is moved and seconded that this report be received.

DR. MERILLAT: I would amend that motion to refer this back to the Executive Board.

. . . The amendment was seconded. . . .

DR. MAYO: While the Chairman of the Committee did not mention my name, he might just as well have done so, and I wouldn't have taken any offense at it whatever. This matter of the report of the Committee has been presented to the Association by myself. I repeatedly did so, but the Committee was not really ready to report. They say this is their final report. It has been hanging fire for a number of years.

This report consists of a very long list,—pages,— of purely anatomical names, and some of us felt that it would be better rather than to publish in the JOURNAL page after page of these anatomical names, to wait until the final report was completed (and they have done a great deal of splendid work in this connection; I am not criticizing the Committee in any way because I think they have done a splendid work), with the idea of having this published as a separate publication, as a report of this Com-

mittee, published by this Association for distribution to those who are interested in this subject.

I believe it will be a matter of economy for the Association and also very desirable from the point of view of the Editor of the JOURNAL, because I feel that a great many members (particularly the practitioners) wouldn't be interested in having the JOURNAL taken up, month after month, or a considerable portion of it, with this long list of scientific names.

I think that this report should be published and in sufficient number so that any one who was interested in any way could procure a copy of this report which is now completed.

DR. MERILLAT: In further explanation of my amendment, I want to explain my position in this matter. During my tenure of office, during 1916-1917 (Dr. Day, by the way, finished out the last half of my period), this same question came up, and each demand to have this printed included a confession that it was not complete, and the recommendations that I made to the Association were to postpone the publication of this until it was complete. The cost of putting into type an incomplete report was not proper.

There never was, during my tenure of office, any objection to publication. The postponement was purely a confession on the part of the Committee that the report was not complete and could not serve a useful purpose, and I don't believe, therefore, that the Committee should charge the officers of this Association with having been opposed to their work. I don't believe it is a fact, and consequently, I would hate to see that written into the records of this Association.

SECRETARY HOSKINS: I might be able to clear the atmosphere a little bit on this point. I think really the only objection that Dr. Sisson had, or the only grievance, was that at various times in the past there had been exorbitant estimates made on the probable cost of publishing this report, and he took it upon himself to solicit bids from printing houses to see just exactly what it would cost, and the report has been printed at an expense of just a little less than two hundred dollars. It is expected that that entire amount will come back into our treasury through the sale of copies of this report at two dollars and fifty cents apiece, and I would like to take this opportunity of extending an invitation to about two hundred members to buy a copy of that report. There are only two hundred copies, and when they are gone, there won't be any more.

DR. H. S. MURPHEY: After, I think, about the third committee was organized, I was made a member of it, and I know something of the history after that. I also know the original history of the grievance that Dr. Sisson has. To give you the history briefly: The recommendation that we have a committee was passed at the Toronto meeting, and Professor Sisson, Dr. Stewart and Dr. Newsom were the original committee.

At the next meeting, in Indianapolis, there was considerable controversy. I defended the position of the committee on the idea of a uniform nomenclature with a Latin basis, and it was accepted. That was written in their report.

Their next report consisted of a large number of terms presented to the New York meeting; the report was accepted and published in book form, and I believe that was the last year that the Association published it in book form, in 1913. At that meeting the question of funds to publish all of these terms together was brought up, and personally we made the motion that the funds be allowed, and that was done at that time.

When the preliminary report was presented, the officers of this Association (I don't know who they were) refused to publish this report, or allow Dr. Sisson any money. He never got over it.

I belong to the committee, but I am in the same boat as the committee, due to this antagonistic spirit that was manifest. Even though we have kept on going, I have taken no part in the work of the committee. I am in the same boat as was the kid who was asked, "Does your father belong to church?"

"Yep, but he ain't workin' at it just now." (Laughter).

This is a very satisfactory set of terms. It means the making of progress, but if those persons who know the status, will think, they will know that a few years ago a committee was appointed from the American Association of Anatomists, cooperating with the committee from the British Association of Anatomists, with the expectation of overhauling the B. N. A. set of terms, getting a uniform set in, namely, human, comparative and veterinary anatomy, and the conditions were such in Europe that it was decided that the best thing to do was to wait a long time.

To be perfectly blunt, it was to wait until both the German peoples and the French peoples were in condition to cooperate, and one of the serious stumbling blocks was the fact that in the previous attempts of this kind to get a uniform nomenclature, the French people had not given any cooperation. It was hoped when the thing was finally done it would be on a Latin basis that

would serve as a basis of anatomy for all parts of the world. I hope this will be a step in that direction.

As a member of that committee, knowing all that, I forgot it when it was time to forget, and I tried to continue to forget it, and I am sorry that part of it is included because bickerings won't get us anywhere. We need to work together.

DR. MAYO: I want to say so far as I was personally concerned, there was no opposition whatever. The matter was presented to an Executive Board of the Association, as fairly as I could present it, and the action taken in the past was entirely by the Executive Board of this Association. I was not a member but if I was to blame in any way, it is my trouble.

DR. MURPHEY: I didn't make myself clear on one thing. There were sufficient funds provided by a motion that was passed on the floor and made a matter of record, at the New York meeting, and those persons who want to verify that can go back to the records of the 1913 meeting, and they will find that money was definitely appropriated by the Association and some of the officers refused to give that money in accordance with the action of the Association.

As a matter of fact, the thing Professor Sisson didn't like was the fact that the Association granted this, and the officers refused to grant it. I would like to see this go to the Executive Board and the bristles taken off before it is published.

DR. MERILLAT: At a meeting of the Executive Board at Kansas City, in 1916, there was presented to the Board some correspondence with Professor Sisson covering this point, and the Board decided at that meeting that in view of the fact that the report was not complete they would not appropriate any money for its publication.

That is a part of the record of the meeting of the Executive Board in the meeting at the Kansas City Veterinary College, and should be on the records of the Association. The Board never took any opposite action; never belittled the committee, but the letters that were read inferred constantly that the Association was belittling the committee, something which was never thought of. It was simply incomplete work that they were waiting to publish at the proper time.

PRESIDENT WELCH: The original motion was that the report be received, and the amendment was that it be referred to the Executive Board.

The question is on the amendment that this be referred to the Executive Board.

. . . . The amendment was carried. . . .

PRESIDENT WELCH: The original motion, as amended, is that this be received and referred to the Executive Board.

. . . . The motion, as amended, was carried. . . .

PRESIDENT WELCH: Is there anything under the head of new business that you wish to present at this time? If not, we will adjourn.

ADJOURNMENT

(To be continued)

SIDELIGHTS ON THE MONTREAL MEETING

Members registered	364
Ladies registered	233
Gentlemen visitors	139
Total registration	736
Estimated attendance	800
New members admitted	198
States represented	36
Provinces represented	8
Veterinary colleges represented	11

DR. DAMMAN IN A NEW POSITION

Dr. A. J. Damman, past-president of the British Columbia Veterinary Association has been appointed Travelling Milk Inspector by the Fraser Valley Milk Producers Association, a cooperative milk producing and retail distributing association of British Columbia dairymen, supplying milk to the cities of Vancouver and New Westminster, B. C.

Dr. Damman's duties consist of adjusting disputes, as to cream and milk tests, between the farm producer and his management, as well as other troubles; also endeavoring to instruct the dairyman how to produce a cleaner quality of milk, so as to eliminate eventually the necessity for, and the cost of, pasteurization, which will bring more profit to the dairyman without increasing the cost to the consumer.

STATE BOARD EXAMINATION

Arkansas State Board of Veterinary Examiners. Little Rock, Ark. Nov. 30, 1923. Dr. Joe H. Bux, Secretary, Little Rock, Ark.

OTHER MEETINGS

GEORGIA STATE VETERINARY ASSOCIATION

The seventeenth annual meeting of the Georgia State Veterinary Association, held in Savannah, September 19-20, 1923, was perhaps one of the most enjoyable occasions in the history of the Association. This was not a mere "cut-and-dried" technical and professional meeting, but one which was both professional and social. An invitation was sent to all veterinarians in Georgia to meet at Savannah, in company with their wives or sweethearts, and there enjoy the hospitality of that historic and interesting sea-port city. In response to this invitation, quite a number of the members brought their ladies with them.

The meeting was held at the Savannah Hotel, and was opened by addresses of welcome on behalf of both the City of Savannah and the Savannah Board of Trade. Honorable W. G. Sutlive, editor of the *Savannah Press*, and State Representative from Chatham County, complimented the veterinary profession upon the work that it is doing toward the preservation of human life through the prevention and control of diseases in live stock, which are communicable to man. Mr. Sutlive opened the gates of the City of Savannah to the Association, and extended us a most cordial welcome. Honorable Mr. Moses, representing the Savannah Board of Trade, welcomed us in his humorous way, and offered the services of the Board of Trade to all in attendance at the meeting. These addresses of welcome threw a double burden upon the member chosen to make the response, but in a short but well delivered talk, Dr. E. D. King, Jr., City Milk and Meat Inspector of Valdosta, voiced the sentiments of the Association.

In the President's address, Dr. A. G. G. Richardson, Dean of the Division of Veterinary Medicine, University of Georgia, featured a review of changes which have taken place in the past two decades. Quoting statistics, he pointed out that, although the loss in equine practice has been marked, the opening up of new avenues of professional revenue have more than offset the loss in equine practice. He urged the veterinarian to take an active part in the program of agricultural diversifica-

tion, which, when well balanced, must include a progressive and profitable animal industry.

The paper on "Veterinary Officers' Reserve Corp, Army of the United States," by Dr. Henry A. Jasme, of Savannah, was well received, and heartily endorsed by Dr. E. D. King, Jr., who led the discussion. Drs. Jasme and King brought out the point that the enlistment in the Reserve Corp would not only benefit the veterinarian from the military training standpoint, but, in the event of hostilities, a Reserve Officer would be rapidly advanced to the higher ranks of his division, instead of having to enlist as a private, as was the case in many instances during the late war.

Dr. W. A. Scott, of Columbus, presented the subject of "Differential Diagnosis between Parturient Eclampsia, in the Bitch, and Strychnine Poisoning." Dr. Scott showed that all cases which present symptoms of spasm should be carefully studied as to history, and recent parturition should be taken into consideration. This paper brought out considerable discussion by the practitioners present, who gave reports of like cases seen in their practices, and the results of various lines of treatment.

Dr. W. E. White, of Tifton, read a paper on "The Effect of State and Federal Disease Control Work on the Practitioner." In his paper, Dr. White showed that were it not for the initiative taken by the State and Federal Governments, in the putting on of campaigns for the control of diseases and the enforcement of certain control measures, by the governments, that the control and eradication of contagious diseases would be in its infancy today. In other words, if the general public had to wait until control measures were promulgated by the practitioner, there would be but little contagious disease control work being done. On the other hand, he pointed out that very little could have been done, if those in authority had not the cooperation of the general practitioner. After all, the veterinary profession is working with one point in view, i. e., the preservation of animal life and consequent saving of human life; so there should be no line of demarcation between the actual practitioner and those engaged in other lines within the army of the veterinary profession. This paper was creditably discussed by Dr. J. E. Severin, of Athens.

Dr. A. L. Hirleman, U. S. Inspector in Charge of Tuberculosis Eradication Work in Georgia, next gave a chart talk on "Experi-

ences in the Eradication of Tuberculosis in a Badly Infected Herd." The experiences covering the testing of this particular herd covered a period of about six years. It was shown that herds of cattle may acquire a tolerance to one-method of testing and that once a herd acquires this tolerance, it is sometimes impossible to rid it entirely of tuberculosis by one method testing. Dr. Hirleman showed that, by the triple combination test, fifty-one animals out of a herd of seventy-one head were tuberculous. It was shown by this triple combination test, that all cattle do not react to all three tests, but that some will react to all three, some to two tests of the combination, and some to one test only. Nine head in this particular herd reacted to the ophthalmic test only, and, upon post-mortem, well marked tubercular lesions were found. This paper brought out some interesting discussions and comments.

In the paper, "Some Experiences in the Use of Hog Cholera Serum and Virus," Dr. Harry Trumbo, Veterinary Inspector in Hog Cholera Control Work in Georgia, gave some interesting experiences in this work, and carried the use of serum in the immunization against cholera, almost from its inception to the present time. He brought out the point that good results in the use of serum and virus not only depend upon potent serum and virulent virus, but upon the care exercised by the operator in performing the work and the proper handling of the herds following vaccination. Dr. Trumbo also stressed the point of making a proper diagnosis of the disease before serum and virus are brought into use. This paper was discussed at length by Dr. W. B. Hirleman, Waynesboro; Dr. John W. Salter, Dawson; Dr. H. F. Hook, Statesboro, and other members of the Association, who brought out varying degrees of success following the use of serum and virus, and advanced various theories as to the cause of unusual results in the use of the simultaneous method of immunization.

The next paper, "When is a 'Used Cow' a Safe Buy?" by Dr. John W. Casey, Assistant State Veterinarian, McRae, Georgia, precipitated a lengthy discussion upon the question of the veterinarian qualifying himself as a good judge of cattle. This discussion was led by Dr. Bahnsen, who stressed the importance of the veterinarian being able to pass upon the merits of a cow, and thus make himself of value to the cattle buyer, and the general live stock interests of his community. He pointed out that the veterinarian should be in a position to

judge an animal, not only from a health point of view, but also from the standpoint of its intrinsic value in a dairy or breeding herd. This paper was also discussed by Dr. W. M. Burson, of Athens, Dr. Salter, of Dawson and Dr. R. M. Walsh, of Atlanta.

This concluded the program of the first day, and the members of the Association signed off until the following day.

The second day was one which will long be remembered by those present. About 8:30 a. m., the Association members and their ladies boarded the steamer "Clivedon" for a cruise down the historical Savannah River and through the winding streams and straits between the many islands at the mouth of this river. As we rode down the river, we passed old Fort Jackson, from which point the Savannah harbor and city were protected against possible attacks by the British during the War of 1812. This fort, built of brick, appeared to have withstood the ravages of the elements wonderfully well during the past century. There was noticed a moat surrounding this old fort, to protect it against land attacks, and a tunnel leading from the river into this moat, through which small craft could be pushed during low tide. Farther down the river the "Waving Girl" signaled the boat from the porch of her house, as has been her custom in the case of every boat passing into or out of Savannah for the past many years. At this point, Dr. W. P. Cox's field glasses became quite popular, but due to the trees along the shore, not many could see the smile on the face of the "Waving Girl." The river began to widen here, and we were soon steaming out past Tybee, that noted Georgia bathing resort—where Dr. Cox again became popular, and past the famous Tybee Light, and thence out onto the bounding high seas. The sea was quite calm and bounded but very little—only enough to thrill the passengers of the boat, as the slow, steady rolling of the craft took place. From this point, a large sea-going steamer was seen plowing its way to some more southern port.

After a short trip on the blue sea, the boat was turned into the channel toward Buck Island. In this channel we passed the white, red-topped light-houses on Daufuskie Island, passed numerous craft containing fishermen of crabs, shrimp and other sea foods, and finally were steered into one of the crookedest channels on the coast—Ram's Horn Creek. (The man who named this creek evidently raised Merino sheep.) Whole armies of fiddler crabs were seen along the banks of this channel. It was remarkable how these crabs knew just how far up the

bank to go, to get beyond the wash of the waves, as the boat went by them. Numerous islands are to be seen here, and on some of them small farms have been developed.

About this time the salt air had whetted the appetites of the passengers of the boat, and a raid was made on the bar, where beer—or what had once been beer, and shrimp were served. From then on, the bar-tender and his assistant were quite the most popular persons on board. The basket of shrimp soon looked like it had been well attended.

At noon the craft was tied up at the Picnic Grounds on Daufuskie Island, and all went ashore for more than an hour. Here we watched fishermen bring in boat loads of fish, crabs and shrimp. A mess of crabs was bought and cooked on the boat. To many this was their first experience with eating crab meat. It was on this island that a close watch had to be kept on Dr. W. C. (Bill) Stroud to keep him from wandering away, and getting lost, in his search for a “still.” Dr. W. E. (Bill) White had his wife with him, so was well under control.

After returning to the boat, lunch, with beer, was served, cafeteria style, after which a short business meeting was held. At this meeting, Dr. J. M. Sutton, Sylvester, was chosen president for the coming year, with Dr. J. E. Severin, Athens, vice-president. Dr. Peter F. Bahnsen, Americus, was re-elected secretary-treasurer. Columbus and Atlanta contested for the next meeting place, and Columbus won by a large majority.

After the meeting, the boat was untied and headed for Savannah. The meeting this year was voted the “best ever,” and Drs. W. A. Scott and B. N. Lauderdale, of Columbus, were instructed to get everything well primed for the meeting next year.

This was the first Association meeting at which ladies were in attendance, and it is hoped that, in the future, we may see them present each year, and in greater numbers.

PETER F. BAHNSEN, *Secretary*.

The Philadelphia Division of the United States Bureau of Animal Industry Veterinarians held their regular meeting at the University of Pennsylvania School of Veterinary Medicine, on October 9, 1923. Dr. Thomas Castor addressed the meeting on the subject of the Relation of the Lymphatic System to Meat Inspection.

SOUTHEASTERN MICHIGAN VETERINARY MEDICAL ASSOCIATION

The regular quarterly meeting of the Southeastern Michigan Veterinary Medical Association was held in Detroit, Michigan, Wednesday, October 3, 1923. There were forty-two members and visitors in attendance, President H. T. Carpenter presiding.

The program was opened with an address by Colonel O. G. Brown, Medical Instructor for the Michigan National Guard. He related the progress that had been made in the organization of a veterinary unit, and asked the veterinarians present to lend their assistance in completing the organization. Drs. Warren P. S. Hall and R. F. Blatchford, of Detroit, are the veterinarians attached to the unit.

Dr. Ward Giltner, of East Lansing, and Secretary-Editor Hoskins reported on various phases of the recent meeting of the A. V. M. A., in Montreal.

The literary program of the evening was offered by the Detroit branch of the Bureau of Animal Industry, and consisted of four very interesting papers bearing upon the subject of meat inspection. The first paper was presented by Dr. E. P. Schaffter, Inspector-in-Charge. His subject was "Tuberculosis of Bovines with Observations on the Avian Type in Swine." Dr. Schaffter reported that quite a few cases of tuberculosis encountered in the packing plants, in Detroit, were of the avian type, and that he believed it was possible to pick out lesions caused by the avian type of the tubercle bacillus with a little experience.

Dr. Joseph E. Zeltzer, presented "Post-Mortem Examination of Reacting Cattle." This paper related in a very systematic manner the various steps in a complete post-mortem examination of the carcass of a reactor.

"Parasites Infesting Meat-Producing Animals, Considered from a Sanitary Viewpoint" was the subject of a paper presented by Dr. H. L. Cotton, who brought out a number of very interesting points in connection with parasites which are sometimes found in food-producing animals. He paid particular attention to *Cysticercus cellulosae* and *Taenia solium*.

Dr. J. W. Vance presented a paper entitled "Stock-Yards Inspection and Regulations Governing Interstate Movement of Live Stock." This paper indicated that the author had a very comprehensive idea of the whys and wherefores of the present regulations.

Following the reading of the papers, there was an open discussion on the subject of "Municipal Meat and Milk Inspection," opened by Dr. H. H. Sparhawk, Chief Veterinarian of the Detroit Board of Health. Dr. Sparhawk announced that ordinances for the inspection of meat and milk were being considered by a large number of cities and towns throughout the State, and that it was the duty of every veterinarian to be posted on this subject, and to keep themselves in readiness to offer information on the subject when called upon.

State Veterinarian B. J. Killham endorsed the sentiments expressed by Dr. Sparhawk and offered additional evidence to indicate that the question was one to which every veterinarian should give his attention, even though it might necessitate some personal sacrifice for the time being. The suggestion was made that it might be a good plan to arrange for a conference in the near future and invite to it the proper officials in all of the cities and towns throughout the State which were considering some form of municipal food inspection. No definite action was taken.

H. PRESTON HOSKINS, *Secretary-Treasurer.*

DIXIE VETERINARY MEDICAL ASSOCIATION

The first annual meeting of the Dixie Veterinary Medical Association was held at Memphis, Tenn., in the Hotel Chisca, October 10th and 11th, 1923, Dr. Walter Martin, of Jonesboro, Ark., presiding. About seventy-five veterinarians were in attendance from Tennessee, Alabama, Mississippi, Louisiana, Arkansas, Missouri, Illinois, Kentucky, and several other states.

Following the invocation by Rev. C. C. Webdell, the Association was welcomed to Memphis by Mayor J. Rowlett Paine. Dr. E. I. Smith, of Nashville, Tenn., ably responded to the Mayor's address of welcome.

The literary program was opened with a paper by Dr. L. A. Merillat, of Chicago, Ill., entitled "The Therapeutics of 1923." In this paper the author reviewed the important progress that had been made in the field of therapeutics recently, and pointed out the more important of these for practical application by veterinarians. He paid special attention to the progress which has recently been made in the handling of diseases of breeding cattle and the treatment of animals infested with internal parasites. Dr. Merillat also referred to recent progress in the

field of surgery, citing a number of the newer operations, as well as improved methods of employing anesthetics.

Dr. W. B. Lincoln, State Veterinarian of Tennessee, made a brief address on the subject of control work in his State. It was quite apparent from what Dr. Lincoln said, that the practicing veterinarians of the State of Tennessee have nothing to fear in the way of encroachment upon their fields of practice by veterinarians in State employ.

After luncheon the members gathered in a circle around Dr. B. F. Kaupp, of Raleigh, N. C., who gave a splendid talk and demonstration on a fowl, including a complete autopsy, with a discussion of the various steps in the process of digestion, coupled with remarks on the diseases affecting the different organs of the alimentary tract. This proved to be one of the most instructive numbers on the program, and all of the veterinarians present exhibited a very deep interest in the subject, indicative of the growing importance of poultry practice everywhere.

Dr. J. V. Lacroix read a very fine paper on the subject of "Animal Hospital Management." Dr. Lacroix has had a great deal of experience in connection with his small animal hospital in Evanston, Ill., and gave the veterinarians present a large number of very valuable pointers in connection with diseases of small animals and how best to handle them. Dr. Lacroix mentioned a number of things, which, when done in the right spirit, should not be construed as violations of our code of ethics, as some might think, but as perfectly legitimate business-builders.

"Swamp Fever" was the subject of a paper presented by Dr. Wm. L. Gates, of Clarksdale, Miss. The writer is located in a district where there is a great deal of this infection, and it is a very serious problem for the veterinarians, as well as the owners of horses and mules in that territory. Dr. Gates reported apparent cures, following the administration of large doses of arsenicals, but in the discussion which followed, it was pointed out that cases of apparent recoveries may not be such in the true sense, but may be carriers of the virus, and highly dangerous as such. It was pointed out that it is just as important to know the correct dosage of the drug administered as it is to find a satisfactory medicinal agent. An insufficient dose of a highly efficient drug, in a disease such as swamp fever appears to be, may be productive of the carrier state in the animal treated and subsequent uselessness of the particular drug employed.

The evening program consisted of a number of very interesting moving picture films, exhibited by Dr. D. F. Luckey, Livestock Commissioner, National Stock Yards, East St. Louis, Ill., and two very lively boxing bouts by local talent.

The program Thursday morning was opened with a paper by Dr. J. P. O'Connor, of Nashville, Tenn., entitled "Field Experiences in Hog Cholera Control." This was followed by a splendid discussion, in which Drs. H. C. Curry and C. M. McFarland, of Kansas City, Mo., and Dr. A. C. Drach, of Omaha, Neb., took part. Dr. A. T. Kinsley, of Kansas City, Mo., then followed with a paper entitled "Something of Interest on Swine Diseases." In this paper Dr. Kinsley brought out the fact that the South was apparently not alive to the possibilities in the field of swine production, and he offered some very worthwhile suggestions as to how veterinarians might make themselves very useful in encouraging the raising of more swine in our southern states. Dr. Kinsley stated that the feeders throughout the corn belt would take all of the pigs that the South could produce, and that there was even now a practically continuous, ready market for them.

Dr. C. A. Cary, State Veterinarian of Alabama, addressed the meeting on the subject of "Sane State Regulations and Rules." Dr. Cary deplored the fact that greater progress has not been made in the eradication of hog cholera, in spite of the great amount of effort, time and money that has been expended in this direction. A very animated discussion followed.

Dr. H. Preston Hoskins, Secretary-Editor of the American Veterinary Medical Association, addressed the meeting on matters of interest in connection with the national association. He briefly reported on the transactions of the recent meeting in Montreal and plans for the coming year. He made a plea for the better support of the JOURNAL, especially by practitioners, and stated that it was the height of his ambition to see every eligible veterinarian in the country enrolled as a member of the Association. Having been approached by several of the local veterinarians concerning the possibility of getting the 1925 meeting for Memphis, he cautioned them against getting in the field for this meeting without a full realization of the responsibilities connected with entertaining such a large body. Dr. Hoskins briefly outlined the general plan of the program of annual meetings.

Following luncheon, the members were given a treat in the

form of two papers, by Dr. J. C. Flynn, of Kansas City, Mo. These dealt with the importance of small animal practice to the present-day veterinarian, and two diseases which have been giving the veterinarians in southern states considerable trouble of late, namely, so-called fright disease and black tongue. Dr. Flynn gave some very valuable pointers on handling a small animal practice, and related his experiences with the two diseases mentioned. One of the most interesting points brought out in his talk was the apparent relationship between a certain brand of commercial dog biscuits and so-called fright disease. He reported on having been successful in reproducing this disease in nine days by feeding dogs a certain brand of dog biscuit. The writer leaned to the belief that the disease is dietary in nature, for the reason that a change in diet invariably leads to recovery. A very enthusiastic discussion followed.

"Prophylactic Vaccine Against Rabies," was the subject of an address by Dr. Adolph Eichhorn, of Pearl River, N. Y., who briefly reviewed the history of vaccination against rabies, leading up to the recent development of the single-dose vaccine, now being used with such great success in the control of the disease among dogs, and incidentally saving the lives of a great many other animals as well as human beings. Dr. Eichhorn ably answered a large number of questions asked of him, relative to the vaccine and its use under various conditions.

The literary program closed with the reading of a splendid paper by Dr. E. I. Smith, of Nashville, Tenn., entitled "The Creation of New Veterinary Medical Associations, Their Duties and Obligations." In this paper Dr. Smith predicted a wonderful future for the Dixie Veterinary Medical Association. He enumerated a number of things which veterinarians should constantly have in mind, with a view to increasing their efficiency, concluding with the advice to read the veterinary medical journals, study thoroughly each individual case, and always attend every meeting of the Dixie Veterinary Medical Association.

Thursday evening a sumptuous banquet was served, followed by an elaborate entertainment consisting of music, both vocal and instrumental, readings, and dancing. At a short business session, a constitution and by-laws was adopted and the following officers elected for the ensuing year: President, Dr. F. J. Douglas, New Orleans, La.; First Vice-President, Dr. Chas. H. Wright, Jackson, Tenn.; Second Vice-President, Dr. W. G. Warren, Gallatin, Tenn.; Secretary-Treasurer, Dr. C. C. Brown, Memphis, Tenn.

NECROLOGY

WILLIAM F. KIRCHNER

Mr. William F. Kirchner, of New York City, father of Mrs. Robert W. Ellis, died October 8, 1923. Many of our older members, who attended the meeting in New Haven, in 1906, and a number of those immediately subsequent, will remember Mr. Kirchner, who derived much pleasure in attending our annual gatherings in company with Dr. and Mrs. Ellis.

Mr. Kirchner attended the Grand Army National Encampment, at Indianapolis, in 1921, and while there was the victim of an apoplectic strike, necessitating a three-months stay in the hospital. He improved right along, until the last week in August, when he was stricken with a light attack of la grippe, which left his heart quite weak. He never rallied completely and died suddenly at 7:40 p. m., October 8. He was in his 82nd year.

He was a member of the Military Order of the Loyal Legion (Officers of the Civil War), the Army of the Potomac and the G. A. R. since 1868. He took a very active part in the affairs of the G. A. R., having been chairman of the Memorial Committee when he was first stricken. In 1918 he was Department State Commander of New York. He served for thirty-eight years as a member of the police force in New York City, having retired with rank of Captain in 1901.

LLOYD K. MAGLEY

Dr. Lloyd K. Magley, of Decatur, Indiana, died September 4, 1923, following an attack of acute dilatation of the heart. He was born in Decatur, October 15, 1892. He married Miss Luella M. Conrad, March 1, 1916.

Dr. Magley was a graduate of the Indiana Veterinary College, class of 1915. He entered the Veterinary Reserve Corps and saw overseas service, reaching the rank of Captain. He joined the A. V. M. A. in 1918. He was also a member of the Indiana State Veterinary Medical Association and the Northeastern Indiana Veterinary Medical Association.

JOHN SEVENSTER

Dr. John Sevenster, of Hamburg, Iowa, died April 24, 1922. He was born in Dokum, Province of Friesland, Holland, October 24, 1868. He married Miss Jennie Hern, of Buffalo, N. Y., November 23, 1912, who survives him.

Dr. Sevenster received his early veterinary training at the Veterinary College in Utrecht, Holland, graduating in 1892. Two years later he came to America and practiced in New York State for a while. Later he attended the McKillip Veterinary College and graduated in 1905.

Entering the meat inspection service of the Bureau of Animal Industry, the same year, he was assigned to South St. Joseph, Mo., and later to Chicago and Omaha. He was for a time on tick eradication under Dr. J. A. Kiernan. He resigned in 1911 to enter private practice at Hamburg, Iowa. He was an Assistant State Veterinarian at the time of his death.

FRANK HUNT

Dr. Frank Hunt died at his residence, 409 Cherry Street, Jamestown, N. Y., on September 29, 1923, after an illness of several months. He was sixty years of age.

Graduating from the Ontario Veterinary College, in 1887, Dr. Hunt returned to his home town after graduation and practiced there for over thirty-five years. He served his city as a member of the Board of Health and for many years was City Inspector.

Dr. Hunt joined the A. V. M. A. in 1907. He was an Elk and also a Knight of the Maccabees. He was held in high esteem in his community and will be greatly missed by all those who had the privilege of knowing him.

F. F. R.

C. LINCOLN FURBUSH

Dr. C. Lincoln Furbush, of Philadelphia, Pa., died July 1, 1923. He performed meritorious military service in Cuba and the Canal Zone, and gave material assistance in the Surgeon General's Office during the World War in organizing the Veterinary Corps. Dr. Furbush was Director of Health and Charities of Philadelphia at the time of his death.

C. J. M.

IRWIN C. NEWHARD

Dr. Irwin C. Newhard, of Ashland, Pa., died suddenly, at his home, September 24, 1923. He was a graduate of the New York College of Veterinary Surgeons, class of 1893, and enjoyed a very extensive practice in Schuylkill County (Pa.) for many years. Much of his work was with mules used in the coal mines.

Dr. Newhard joined the American Veterinary Medical Association at the Philadelphia meeting in 1908. He took an active part in the Pennsylvania State Veterinary Medical Association and the Schuylkill Valley Veterinary Medical Association.

ROBERT E. COLLINS

Dr. Robert E. Collins, of Memphis, Tenn., died very suddenly August 5, 1923. Heart failure was the cause of death. He stopped at a garage, in Memphis, and while the attendant went inside to get something for Dr. Collins, the latter collapsed alongside his car. It was not known until after his death that he had been suffering from heart trouble.

Dr. Collins was a graduate of the Ontario Veterinary College, class of 1893. He enjoyed a very lucrative practice at the Union Stock Yards, in Memphis. He joined the A. V. M. A. in 1907.

MRS. CLARKE HEDLEY

Mrs. Clarke Hedley, wife of Dr. Clarke Hedley, of Conway, South Carolina, veterinary inspector of the B. A. I. Tick Eradication Division, died suddenly October 2, 1923, at the home of her sister, in Harrisburg, Pa., while on a vacation trip, having motored there from the South. Mrs. Hedley leaves her husband, a daughter, Mrs. Moyelia Sessions, and a sister to mourn her loss.

C. PRICE DIXON

Dr. C. Price Dixon, of Charlottesville, Va., died February 24, 1923. Pneumonia was the cause of death. Dr. Dixon was ill but a few days. He was a graduate of the Ohio Veterinary College, class of 1893. He joined the A. V. M. A., in 1907.

LEONARD G. W. HART, SR.

Dr. L. G. W. Hart, Sr., whose serious accident was chronicled in the October issue of the JOURNAL, died September 12th. He was a graduate of the Ontario Veterinary College, class of 1892, and practiced for many years at Chippewa Falls, Wis. He joined the A. V. M. A. in 1917. He was a member of the Wisconsin Veterinary Medical Association and always took a very prominent part in the affairs of that body.

FREDERICK E. COMMINS

Dr. Frederick E. Commins, of San Francisco, Calif., died June 21, 1923, after an extended illness. He was a graduate of the San Francisco Veterinary College, class of 1910. Dr. Commins was a veterinary inspector for the Board of Health of San Francisco. He joined the A. V. M. A. at the Oakland meeting, in 1915. He was in his 37th year at the time of his death.

IRVING D. SOUTHWORTH

Dr. Irving D. Southworth, of Gillette, Wyoming, passed away July 27, 1923, at Batavia, N. Y., his old home, after an illness of almost a year.

Dr. Southworth was a graduate of Ohio State University, class of 1911. Shortly after graduation he located in Avon, N. Y., and then removed to Blackfoot, Idaho. For a time he was Assistant State Veterinarian of Idaho. He was a member of the Alpha Psi Fraternity.

H. E. WARD

Dr. H. E. Ward, of Sanford, Maine, died suddenly during the latter part of September.

Our sympathy goes out to Dr. Baltazar Karganilla, District Veterinarian, Balanga, Bataan, Philippine Islands, who has suffered a double misfortune in the successive death of two of his children recently.

MARRIAGES

Dr. H. T. Larson and Miss Teela Hedman, of Ashland, Wis., Aug. 29, 1923.

Dr. F. M. Monroe, of Dana, Ind., and Miss Myrtle Miller, June 21, 1923.

BIRTHS

Dr. and Mrs. E. T. Brockman, of Letcher, S. D., a daughter, Sept. 5, 1923.

Dr. and Mrs. H. C. Stephenson, of Ithaca, N. Y., a daughter, Oct. 7, 1923.

Dr. and Mrs. J. A. Latham, of Baldwin, Kan., a son, Albert, Aug. 28, 1923.

Dr. and Mrs. E. A. Miller, of Indianapolis, Ind., a daughter, Patricia Jane, Aug. 9, 1923.

Dr. and Mrs. John L. Bullock, of Oxford, N. C., a son, George Pleasant, July 26, 1923.

Dr. and Mrs. L. W. Stevens, of Wilsonville, Nebr., a son, Lee Frederick, Aug. 19, 1923.

Dr. and Mrs. F. W. Seekamp, of Greenfield, Ill., a son, Frederick William, Jr., Aug. 30, 1923.

Dr. and Mrs. Z. L. Williams, of Cleveland, Wis., a daughter, Elizabeth Lois, Aug. 14, 1923.

PERSONAL

Dr. Hubert C. Smith (Iowa '23) is located at Jesup, Iowa.

Dr. Curtis A. Fridirici (U. P. '21) has located at Fogelsville, Pa.

Lt. S. C. Dildine (Ohio '17) is stationed at Fort Sam Houston, Texas.

Dr. J. Chas. Wheat (Corn. '13) has removed from Moravia, N. Y. to Syracuse.

Dr. S. G. Bittick (Chi. '16) of Fort Worth, Texas, is City Milk and Dairy Inspector.

Dr. Willis B. Lincoln (Iowa '93) has been appointed State Veterinarian of Tennessee.

Dr. A. P. Sturrock (Corn. '17) of Waterford, Pa., was a recent visitor in Ithaca, N. Y.

Dr. Myron L. Plumer (U. P. '16), formerly at Branchville, N. J., is now at Newton, N. J.

Dr. G. C. Monroe has removed from Walnut Cove, North Carolina, to Mount Airy, same state.

Dr. F. A. Humphreys (Ont. '19) is now at Yorkton, Sask., having been transferred from Regina.

Dr. A. F. Schalk (Ohio '08) is on a short leave of absence from the North Dakota Agricultural College.

Dr. Joseph W. Vansant, Fox Chase, Pa., is enjoying his vacation hunting big game in the Maine woods.

Dr. Raymond J. Lynch has associated himself in practice with Dr. B. H. Tallman, at Williamsport, Pa.

Dr. Clyde C. Hunt, formerly of Washington, N. C., gives his new address as 51 Fifth Street, Lorain, Ohio.

Dr. J. H. Yarborough (Iowa '23) has removed from Lowryville, S. C., and located at Denmark, same state.

Dr. A. H. McClelland (Corn. '12), formerly of Buffalo, is now engaged in general practice at Walton, N. Y.

Dr. V. S. Larson (Chi. '10), of Berlin, Wis. has succeeded Dr. O. H. Eliason as State Veterinarian of Wisconsin.

Dr. Chas. W. Humphrey (Geo. Wash. '11), is now stationed at Lancaster, Pa. His address is 732 N. Lime Street.

Dr. Joseph Patt, of Mobile, Alabama, has returned to his practice after an absence of four months spent in Colorado.

Dr. R. R. Birch (Corn. '12) and family have returned to Ithaca, N. Y., after an extended automobile trip through the West.

Dr. Harry M. Martin (U. P. '16), of the University of Nebraska, has been elected a member of Sigma Xi honorary fraternity.

Dr. F. W. Graves (Ind. '12), formerly of Hillsboro, Ind., has purchased the practice of Dr. J. A. Schwartz, at Wolcott, Ind.

Dr. R. O. Feeley (N. Y.-Amer. '06), of Clemson College, S. C., has returned to his work after having been absent on a sick leave.

Dr. Harry J. Little, of Williamsport, Pa., received the nomination for Sheriff on the Democratic ticket, at the last election.

Dr. Roscoe C. Davis (Corn. '15), of Clinton, N. Y., has accepted a position with the State forces engaged in accredited-herd work.

Dr. T. M. Bayler (Chi. '11), of the McLean County Farm Bureau, is now at Normal, Illinois, having removed from Bloomington.

Dr. H. D. Laird (Corn. '11), formerly at Woodville, N. Y., is now at Owego, where he is acting in the capacity of County Veterinarian.

Dr. J. R. Varley (Corn. '20), who spent a year in Hawaii, has just returned and accepted a position with the Dairyman's League of New York.

Dr. C. H. Beckman (Iowa '20) of Humboldt, Iowa, recently joined the benedicts and is reported to have gone to Missouri for his honeymoon.

Dr. Geo. J. Gruenewald (McK. '14) has been transferred from Charleston, W. Va., to Trenton, N. J., with headquarters at 403 Wilkinson Building.

Mrs. Theodosia Baker, wife of our eminent ovine specialist, Dr. E. T. Baker, of Moscow, Idaho, has been appointed a member of the Idaho State Board of Nurses' Examiners.

Dr. J. B. Reidy (Corn. '02), B. A. I. Inspector in charge, Tuberculosis Eradication, Augusta, Maine, has been appointed Captain in the Veterinary Officers' Reserve Corps.

Dr. A. M. Mills (Corn. '20) has resigned his position at Cornell University to take up work with the Borden Farm Products Company. He entered upon his new duties October first.

Dr. M. H. Mabey (Corn. '17) has given up his practice at Cuba, N. Y., to take the place vacated by Dr. A. M. Mills, in the Department of Surgery, at Cornell, under Dr. J. N. Frost.

Dr. H. J. Milks (Corn. '04), E. Sunderville (Corn. '08) and C. E. Hayden (Corn. '14) represented the N. Y. State Veterinary College at the State Fair, the second week in September.

Dr. E. T. Booth (U. P. '09) Demonstrator of Anatomy at the School of Veterinary Medicine, University of Pennsylvania, has been ill for several weeks but is now convalescent.

Dr. J. F. Shigley (Corn. '15), for a number of years located in St. Paul, Minn., has accepted the position of Assistant Professor of Veterinary Science at the Pennsylvania State College.

Dr. J. Allen Hardy, for several years connected with the Board of Health of Detroit, Mich., has accepted a position in Charleston, W. Va., in connection with meat and milk inspection in that city.

Dr. Robert H. Wilson (K. S. A. C. '09), of Rochester, Mich., is chairman of a committee appointed by the Board of Commerce to draw up a milk inspection ordinance for the city of Rochester.

Dr. Clifton D. Lowe (Ohio '10) has resigned as State Veterinarian of Tennessee, to accept a position as Extension Animal Husbandman in the Bureau of Animal Industry, at Washington, D. C.

Dr. V. A. Moore was a guest at the dinner given by Editor Barnum, of the Syracuse Post-Standard, during State Fair week, for the leading representatives of the agricultural and live stock interests of New York State.

Francisco Menendez Guillot, formerly official veterinary inspector for the northern district of Porto Rico, is now connected with the Veterinary Extension Division of the Department of Agriculture, with offices at San Juan.

Dr. Septimus Sisson (Ont. '91) attended the forty-first annual meeting of the National Veterinary Medical Association of Great Britain and Ireland, at York, England, during August, and was honored by election to honorary membership in the Association.

Dr. J. G. Catlett (U. S. C. V. S. '16), formerly Inspector-in-charge at the Southeastern Packing Company, Fort Lauderdale, Florida, has tendered his resignation and has entered private practice at Miami, Florida. Dr. Catlett has been appointed part-time Dairy Inspector in that city.

Dr. Miller F. Barnes (U. P. '11) who has been associated with the Pennsylvania Bureau of Animal Industry in the capacity of specialist in the investigation of abortion and other diseases of the genital organs of cattle, has been appointed in charge of the Division of Laboratories of the Pennsylvania Bureau of Animal Industry located at Philadelphia, to succeed Dr. Fred Boerner, Jr. Dr. Barnes will continue with work in the investigation of cattle diseases.

Dr. William Sheppard (M. R. C. V. S. '70) recently sold the old Sheppard mansion and estate at Neck Road and East Thirteenth Street, Sheepshead Bay, Brooklyn, N. Y. The mansion is over one hundred years old and is said to be in such good condition that it will be moved to other ground instead of being torn down. Dr. and Mrs. Sheppard will make their home in Florida. They have gained a great deal of pleasure from raising some very fine Pekingese spaniels. Dr. Sheppard will be seventy-five years old on the 16th of next March.

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 735 Book Building, Detroit, Mich.

C. H. STANGE, President, Ames, Iowa.

M. JACOB, Treasurer, Knoxville, Tenn.

Executive Board

GEO. HILTON, 1st District; T. E. MUNCE, 2nd District; D. S. WHITE, 3rd District
J. A. KIERNAN, 4th District; C. E. COTTON, 5th District; B. W. CONRAD,
6th District; CASSIUS WAY, Member at Large, CHAIRMAN.

Subcommittee on Journal

D. S. WHITE

J. A. KIERNAN

The American Veterinary Medical Association is not responsible for views or statements published in the JOURNAL, outside of its own authorized actions.

Reprints should be ordered in advance. Prices will be sent upon application.

Vol. LXIV, N. S. Vol. 17

December, 1923

No. 3

HAVE WE YOUR CORRECT ADDRESS?

Will you kindly look at the address on the envelope in which this issue of the Journal was received. Is the address correct? During the past few months we have given our mailing list a very careful checking, as a result of which we have found it necessary to have almost a thousand new stencils made. This has been quite a task and has cost considerable money.

The Executive Board has authorized the publication of a new membership directory. There has been none published for three years, so a new edition is badly needed. Unless we are advised to the contrary, members will be listed with their addresses just as the same appear on the envelope in which this issue of the Journal was mailed.

Members who are delinquent will not be listed, of course. May we have your cooperation in making the directory accurate. Advise us immediately of any inaccuracy, either in your name or address.

A nominal charge will be made for copies of the new directory. The heavy expense will not permit free distribution to the entire membership, as heretofore. The price per copy will be announced next month.

DANGER AHEAD

In discussing the present shortage of students in our veterinary colleges, there seems to be one phase of the situation that is generally overlooked. Figures published in the November issue of the *JOURNAL* show that we can not expect to have more than 150 veterinarians graduated each year, for the next four years, from the colleges in the United States and Canada. The number is likely to be some less than 150 per year. This number will fall far short of replacing those who are lost to the profession through death, retirement and entry into other fields.

In answer to those who maintain that there has been overproduction in the past, we will grant that this may have been the case for a few years. From 1910 to 1918, both years inclusive, there was an average annual crop of 743 veterinarians graduated from our colleges. In the five years since 1918, this number has dropped to approximately 240, less than one-third of the 1910-1918 period. This is out of all proportion to the demand for veterinary services, and if present conditions do not change there is bound to be a shortage of qualified veterinarians in the not-far-distant future.

The danger of the situation lies in the fact that our various veterinary practice acts are very likely to be tampered with. Large territories without the services of registered veterinarians will feel the need of some sort of veterinary service and the tendency will be to seek relief through remedial legislation, designed to relax present statutes and give the right to practice to unqualified individuals—quacks—to call spades spades. In this connection the fact should not be overlooked that we now have educated quacks, who are likely to cause more trouble for qualified veterinarians than the ignorant quacks of by-gone days ever did.

To substantiate the belief that the danger is real and actually exists, examination of the legislative summary published in this issue of the *JOURNAL* shows that in at least eight states, during the present year, there were attempts made to modify unfavorably the present existing statutes regulating the practice of veterinary medicine and surgery. Fortunately, in seven out of the eight states, these attempts were unsuccessful. In one state, although the law was not changed, the Legislature granted the right to practice to eight non-graduates.

Keep this phase of the question in mind and do not underestimate its importance and possibilities.

FEATURES IN THIS ISSUE

This issue might rightfully be designated a feature issue, in view of the fact that we are publishing considerable material that is new to the pages of the JOURNAL. Of these, we might mention the summary of legislative activities in the various states during the present year, directly or indirectly affecting the veterinary profession. This information has been gathered from various sources and is believed to be accurate as far as it goes, though probably not complete. However, it is hoped to make this legislative summary an annual feature of the JOURNAL, and with the start made this year, the 1923 summary can be referred to as a guide for those in the various states who will be asked to report the 1924 crop of legislation.

Closely allied to legislative matters, we present this month a complete list of the various state live stock sanitary officials. There have been a number of requests for such a list and the one being published is believed to be correct up to November 15, 1923.

In another part of the JOURNAL we list the names of members of the Association who are "lost," so far as the Secretary's office is concerned. Mail sent to these members at the addresses given has been returned. It is hoped that our members will be able to help us find these lost members. If you can give the correct address of only one of the members on the list, this will be appreciated.

Do not overlook the proposed policy of the A. V. M. A., published for the first time in this issue. It is hoped that every member will study this diligently.

A bibliography on contagious abortion, compiled by Dr. Ward Giltner, is being published in this issue of the JOURNAL, the same having been omitted from the report of the proceedings of the twenty-sixth annual meeting of the United States Live Stock Sanitary Association.

A report of the meeting of the Women's Auxiliary to the A. V. M. A., held at Montreal in August, is included in this issue, and it is to be hoped that every member will see that this report is read by the female members of his family.

We are able to give a very comprehensive report of the recent World's Dairy Congress this month. You will find it under Association News. There was considerable of a veterinary atmosphere in connection with this gathering, which has been reported by Dr. George H. Hart, of the University of California,

who attended all of the sessions of the Congress, in Washington, Philadelphia and Syracuse.

We take this opportunity to thank all those members who have so willingly assisted in getting together the material for these reports. Without their prompt and whole-hearted cooperation these features would not have been possible.

A WONDERFUL TRIBUTE TO THE HORSE

Did you see the November number of the National Geographic Magazine? If not, you have missed something. By all means secure a copy at once. The entire November issue was devoted to a single article dealing with horses, asses and mules. According to Secretary Dinsmore, of the Horse Association of America, this special edition has been in preparation for more than two years and the cost of this number is estimated to have been in excess of \$200,000. It is the most notable and accurate single contribution to the literature on horses and mules ever published. The color plates, twenty in number, representing every breed, are from paintings made especially for the National Geographic Society. When it is considered that the circulation of the National Geographic Magazine is over 700,000 copies, it can be estimated how great will be the interest in the horse, created by this authoritative exposition of the subject. If you are not already a member of the National Geographic Society, make application for membership immediately, enclosing \$3.00, and stating that you wish your subscription to the magazine to begin with the November issue. The headquarters of the National Geographic Society are in Washington, D. C.

COMING VETERINARY MEETINGS

Illinois Veterinary Medical Association. Lexington Hotel, Chicago, Ill. Dec. 4-5, 1923. Dr. L. A. Merrillat, Secretary, 1827 So. Wabash Ave., Chicago, Ill.

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York City. Dec. 5, 1923.

Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.
Horse Association of America. Blackstone Hotel, Chicago, Ill. Dec. 5, 1923. Wayne Dinsmore, Secretary, Union Stock Yards, Chicago, Ill.

U. S. Live Stock Sanitary Association. Hotel La Salle, Chicago, Ill. Dec. 5-6-7, 1923. Dr. O. E. Dyson, Secretary, 923 Exchange Bldg., Kansas City, Mo.

- Nebraska State Veterinary Medical Association. Grand Island, Nebr. Dec. 11-12, 1923. Dr. F. R. Woodring, Secretary, Lincoln, Nebr.
- Michigan Veterinary Medical Society. Central. Otsego Hotel, Jackson, Mich. Dec. 12, 1923. Dr. W. N. Armstrong, Secretary, Concord, Mich.
- New York Veterinary Medical Association, Western. Erie County S. P. C. A. Headquarters, 121 West Tupper Street, Buffalo, N. Y. Dec. 14, 1923. Dr. F. F. Fehr, Secretary, 243 South Elmwood Ave., Buffalo, N. Y.
- Delaware Veterinary Medical Association and University Veterinary Conference. Wolf Hall, University of Delaware, Newark. Dec. 19, 1923. Dr. C. C. Palmer, Secretary, Newark, Del.
- Massachusetts Veterinary Association. American House, Boston, Mass. December 26, 1923. Dr. C. H. Playdon, Secretary, Reading, Mass.
- Pennsylvania Annual Conference for Veterinarians, University of. Philadelphia, Pa. Jan. 8-9, 1924. Dr. Louis A. Klein, Dean, 39th St. and Woodland Ave., Philadelphia, Pa.
- New Jersey Veterinary Medical Association of. Newark, N. J. Jan. 10, 1924. Dr. P. B. Silvester, Secretary, Princeton, N. J.
- Ohio State Veterinary Medical Association. Deshler Hotel, Columbus, Ohio. Jan. 9-10-11, 1924. Dr. Harry T. Moss, Secretary, 640 S. Main St., Dayton, Ohio.
- Cornell Veterinary Conference, Ithaca, N. Y. January 10-11, 1924. Dr. V. A. Moore, Dean, N. Y. State Veterinary College, Ithaca, N. Y.
- Virginia State Veterinary Medical Association. Richmond, Va. Jan. 10-11, 1924. Dr. Geo. C. Faville, Secretary, Hampton, Va.
- Iowa Veterinary Association. Hotel Savery, Des Moines, Iowa. Jan. 15-16, 1924. Dr. E. R. Steel, Secretary, Grundy Center, Iowa.
- Iowa Practitioners' Short Course. Iowa State College, Ames, Iowa. Jan. 17-18, 1924. Dr. C. H. Stange, Dean, Ames, Iowa.
- Oklahoma State Veterinary Medical Association. Huckins Hotel, Oklahoma City, Okla. Jan. 16-17, 1924. Dr. L. B. Barber, Secretary, Live Stock Exchange Bldg., Oklahoma City, Okla.
- Wisconsin Veterinary Medical Association and Veterinary Short Course. College of Agriculture, Madison, Wis. Jan. 29-30-31 and Feb. 1, 1924. Dr. O. H. Eliason, Secretary, Madison, Wis.

HOG CHOLERA CONTROL VERSUS PREVENTION¹

By I. K. ATHERTON

College Park, Md.

The history of hog cholera covers far more than a span of human life. Investigations regarding it have consumed years in the laboratory and field. This disease has proved so baffling that scientists have been obliged to grope their way in contending with it. Much of the knowledge regarding it has been "stumbled onto," so to speak. Much has been written on the subject, and one idea after another has been suggested, only to be discarded in a large percentage of the instances. For these reasons I find myself, to a great extent, much dependent on others for my information. I have culled from books, pamphlets, newspaper articles and personal experience in the preparation of this paper, which recalls Kipling's verses setting forth the practice of writers generally.

*"When 'Omer smote 'is bloomin' lyre,
He'd 'eard men sing by land and sea;
An' what he thought he might require,
'E went and took—the same as me!*

*"The market girls an' fishermen,
The shepherds an' the sailors too,
They 'eard old songs turn up again,
But kep' it quiet—same as you!*

*"They knew 'e stole; 'e knew they knowed.
They didn't tell, nor make a fuss,
But winked at 'Omer down the road,
An' 'e winked back—the same as us."*

I sincerely trust that you will wink down the road at me as I pass on.

HOG CHOLERA CONTROL

I have often wondered what the promoters of the idea had in view. Control has been the indefinite aim of hog cholera workers for years, yet I doubt whether a single person who used the term has a clear conception of just what would be accomplished by a fulfilment of their efforts. It is certain that

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

"Hog Cholera Control," as we now understand the term, has not been universally successful; in fact, satisfactory results have probably never been attained. Neither do I believe attempts at control will ever prove the solution of the hog cholera problem, for, under a broad conception of the subject, any movement that does not have eradication in view cannot be expected to prove eminently successful or generally satisfactory.

Control work as almost universally conducted has had two phases, the prevention of the spread of the infection from the original or primary outbreak and the protection of hogs by immunization.

It is admitted that much financial benefit to hog growers is accomplished if the spread of the infection from one farm to another can be stopped, but this does not eliminate the original sources of infection. It has been our experience, in Maryland, that with a limited number of outbreaks, the spread of the disease from original outbreaks can easily be prevented. During the year 1922, in 330 of the 354 primary outbreaks, there was no spread of the disease from original outbreaks. In no instance did a secondary outbreak occur when a new center of infection was promptly reported, so that it could be given attention. In fact, this is true of the entire history of the hog cholera work in the State.

Some might consider these results very satisfactory, but they were not. Notwithstanding the fact that these 330 outbreaks were reported in time to prevent the spread of the infection to other farms, the disease had already made such progress in the infected herds before it could be checked that approximately 47 per cent of the swine on these premises were lost. Surely control at its best is not a satisfactory solution of the hog cholera problem. Further, in the remaining 24 primary outbreaks, as will always be the case in a certain percentage of the instances, there were delays of weeks and months before the authorities learned of their existence. As a consequence, the infection was spread from these centers resulting in 235 secondary outbreaks with corresponding losses.

There was nothing gained in combating the disease other than the valuable information that was obtained from studying the outbreaks and saving some hogs. The same fight that was made last year must be made again this year, and continued until sanitarians and stock raisers can see their way clear to inaugurate and rigidly carry out sanitary measures which will

not only stop the spread of the disease to adjacent herds, but prevent the establishment of new centers of infection.

Possibly some might be of the opinion that, compared with the Corn Belt, hog-raising is not carried on extensively in Maryland; that the conditions there are more favorable for preventing the spread of the disease from original centers of infection; therefore the results obtained in one state, Maryland, are not indicative of the conditions in the principal hog-growing states or the possibilities throughout the country in preventing the spread of the disease from original outbreaks.

There might be others, too, of the opinion that the results which I have stated as being unsatisfactory in Maryland are due to the fact that the double treatment is used in that state only to a limited extent.

While considering conditions in Maryland, it should be noted that Maryland stands eighth among the states in the number of the hogs per square mile, and she stands twenty-fifth in the percentage of losses. It is true that the double treatment is probably used less in Maryland than in any other state.

The latest Government and state reports available show that hog cholera is still the most destructive disease of swine. The report of the Committee on Hog Cholera Control, which was made at the last meeting of the U. S. Live Stock Sanitary Association, held in Chicago, early in December, 1922, is most interesting, and we believe is good evidence that we are not obtaining the results believed by many through our present methods and efforts at controlling hog cholera. This report compared one five-year period (from 1907 to 1911 inclusive), when practically nothing was done to control hog cholera, with another period (from 1917 to 1921 inclusive), when approximately \$7,500,000.00 was expended annually for serum, virus, veterinary fees and control work. The comparison of the losses for these two periods shows a difference of only .2 of 1 per cent less during the latter period. It might be well to explain that the first of these two periods just preceded and the other just succeeded the last "wave" of hog cholera which this country experienced.

Our apparent inconsistency in dealing with hog cholera, compared with foot-and-mouth disease, is to my mind very interesting. Not only that, but it would appear that it should be given serious consideration, for undoubtedly it is responsible for the fact that we in our fight against hog cholera are making no headway.

We know nothing more about the causative agent of foot-and-mouth disease than we do about that of hog cholera. Both diseases are caused by filterable viruses. In fact, I believe we have more definite knowledge concerning hog cholera than we have of foot and-mouth disease, yet while we promptly eradicate foot-and-mouth disease on the appearance of an outbreak and pat ourselves on the back for the accomplishment, we continually permit our swine industry, as a matter of course, to suffer annual losses of from thirty to seventy-five million dollars from hog cholera.

In outbreaks of foot-and-mouth disease we take every precaution to eradicate centers of infection. We even go so far, and I believe rightfully, as to slaughter all susceptible animals on the farm where the disease exists, and then thoroughly clean and disinfect the premises. We employ such radical measures for the reason that we realize that we must eliminate centers of infection in order to eradicate an outbreak effectually and permanently. After eradication has been accomplished, we close every known avenue by which we think the infection possibly might again be introduced.

In our dealings with hog cholera we take no such precautions. Farmers and stock raisers are constantly practicing methods of swine management which are positively known to be responsible, not only for starting but maintaining centers of infection. I regret that instances are legion where sanitarians and officials charged with the control of the disease have not only permitted but urged these practices. I refer to *garbage feeding; movement of sick or exposed hogs; and the abuse of the double treatment.*

GARBAGE FEEDING

By this term I mean the feeding of any unsterilized product which might contain infected pork, including table refuse and kitchen swill from the private home. In Maryland we hold this factor apparently responsible for 82 per cent of the new outbreaks. It is regrettable that we do not have more data regarding the number of outbreaks in other states started from feeding garbage. Some contend that the matter of garbage feeding is of more importance in the Eastern States than any other part of the country, which may be true. However, the state veterinarian of a western state informed me that the feeding of garbage is the greatest source of trouble in his state. It is a matter of record that garbage is the principal source of

infection in Canada. I believe that when more attention is given to this subject the information obtained regarding this agent as a source of hog cholera infection will prove astonishing and enlightening.

It may be true that there are more garbage-feeding plants in the East than in the Corn Belt States, but from my observance in different sections of the country it seems evident that the farmers in the Central States depend more on packing-house products for table use than do the farmers of Maryland, and other Eastern States. If this be true, it is very probable that a far larger number of the outbreaks of hog cholera on the farms of the Central States might be traced to this source of infection than is now attributed to it. Generally when the house-wife is trimming cuts of fresh and cured meat for cooking, bones, rinds or scraps are thrown into the swill-pail or garbage-can, and later they are fed to the hogs.

We have been surprised through our investigations to learn the number of outbreaks of hog cholera on farms in Maryland that seem to be traceable to no other cause than infected pork that reached the hogs by way of the swill-pail. One instance is recalled where the hogs were in a pen two feet above the ground. The pen was so enclosed that chickens could not enter. This was done because some of the hogs were chicken eaters. There were no sick hogs in the locality. There had been no hogs brought to the premises for the preceding six months. However, there was a clear history of pork being frequently purchased, and bones, rinds and scraps being fed to the hogs in the swill.

It is astonishing how frequently the feeding of garbage to hogs is recommended, and often without one word of warning relative to the dangers that might result from it. Only recently an article was noted in one of our foremost stock papers, in which a swine husbandman dilated on the advantages of garbage-feeding. The gains mentioned were fabulous, and the information given would lead one to believe that it was a get-rich-quick scheme without a "fly in the ointment." The experiment on which this article was based was conducted for only twenty-four days.

Claims are often made that unsterilized garbage may safely be fed to hogs if they have been immunized by the double treatment. For the sake of argument we will admit that this may be true. However, in our experience we have seen many

"breaks" with heavy losses in garbage-fed hogs to which the double treatment had been administered under the most favorable condition possible in such places.

No matter if hogs can be immunized so that they may be safely fed garbage, the fact remains that garbage, especially city, hotel or restaurant garbage, contains infected pork practically at all times. The bringing of this product on the place certainly results in infected premises. In our dealings with foot-and-mouth disease, one of the arguments that was presented in favor of slaughtering sick and exposed animals was that in the maintenance of a long quarantine it was practically impossible to prevent the spread of infection. If that be the case, then garbage-feeding plants must remain a source of danger year in and year out. At any rate, to maintain a center of hog cholera infection is inconsistent with sanitation, and is one of the inconsistencies which we practice in the guise of hog cholera control.

MOVEMENT OF SICK AND EXPOSED HOGS

Usually this is regarded only in the light of the introduction of new stock for improving the breed or replenishing the herd. However, it has a much broader significance. It is the general practice, when hog cholera makes its appearance in a herd, to cull out the animals that are fit and apparently free from the disease and ship them to market for slaughter. Probably this practice is followed without any thought of wrong-doing on the part of the owners. It has been demonstrated that there are three days, on the average, in the incipient stage of hog cholera, when the affected animals show no evidence of the disease, yet during this time the excretions from the body, or pieces of pork from the carcass are infectious. It is due to the practice of shipping such hogs to market that infected pork is so widely distributed, carrying with it the active virus of hog cholera.

I might be considered a little previous at this time in advocating this procedure, yet I believe that the time will come when an outbreak of hog cholera occurs on a farm the owner will be obliged to keep all the infected herd on his premises until it has recovered; or if he is permitted to ship, then it will be done under rigid police regulations, and all carcasses of such animals will be considered as infectious, and will be permitted

to go out from the packing-house only after the meat has been sterilized.

The introduction of new stock into well herds is generally recognized as being a common cause of outbreaks of hog cholera. In Maryland this practice is believed to be responsible for approximately 15 per cent of our new outbreaks, and it is probably much larger in some other states.

One of the greatest sources of danger, especially in the Corn Belt States, is the importation of stocker hogs, which are shipped from public stock yards immediately after the double treatment has been administered. It has been reported that in one year there were 435 carloads of such hogs shipped into a certain state, and "breaks" occurred in 431 of them.

An official in charge of hog cholera work in one of the Central States makes this statement: "Many feeders are afraid to handle stock-yard feeders, for it appears that they not only bring cholera with them, but other diseases also, which makes raising pigs on the farm a hazardous occupation."

It is possible that many farmers have not been disheartened by the "breaks" which they experienced, as their losses in the aggregate may have been small. However, the infection, no matter how it may have been introduced into free territory, is capable of dissemination, and we surely are inconsistent when we allow hog cholera infection to spread by such methods, when under no circumstances would we permit an animal suffering with, or exposed to foot-and-mouth disease to be introduced into another herd.

ABUSE OF THE DOUBLE TREATMENT

So far as the double treatment is concerned, I have not the slightest desire to condemn it when it is used under proper precautions. Its worth is recognized, and under existing circumstances its use is undoubtedly absolutely necessary; but I do not know of any other biologic of proven value which has been so abused as the combination of anti-hog cholera serum and hog cholera virus. In fact, there is no doubt that by the improper use of virus and serum, or rather their abuse, that hog cholera has not only been introduced into, but centers of infection have been maintained in, localities where it probably would not otherwise have obtained a foothold. I believe also that in many localities more harm than good has been done through the administration of virus. Even under the best of

conditions we sometimes get discouraging and unexplainable "breaks."

In Maryland the simultaneous treatment is wisely controlled, and, so far as starting new centers of infection is concerned, it appears to be a small factor. Only about 3 per cent of our new "breaks" could be traced to that source. However, there is comparatively little of the virus used in the state. The greatest harm that it is doing, in my opinion, is, where, by the use of the simultaneous treatment, many people consider garbage-feeding can be made safe, and thus maintain centers of infection with more or less frequent "breaks."

Last winter I heard a veterinarian representing one of the large serum-producing companies make the statement that there were more "breaks" following the use of the double treatment in the last two years than ever before. Recently, in a periodical devoted to swine-raising, a well known author makes this statement: "About the usual complaints have been received during the last six weeks relative to difficulties following hog cholera vaccination." A report received recently from an inspector in charge of hog cholera work in one of the Corn Belt States contains this statement: "Approximately 25 per cent of our hog cholera diagnoses were post-vaccination troubles, and this continues to be the principal trouble here. It is not a matter of getting them to vaccinate, but to save hogs after vaccination."

Our most competent authorities seem to be divided in their opinions regarding these vaccination "breaks." Some insist that a large percentage of the breaks are diseases other than hog cholera, while others maintain that they are practically all hog cholera. One eminent veterinarian said: "Most 'breaks' can be prevented, but some can not. Let's prevent those we can, and call the others hog cholera. That is what they are." Although opinion is divided to a certain extent regarding these "breaks," it is admitted that a certain percentage of them are undoubtedly hog cholera.

I believe one of the greatest factors in the abuse of the double treatment is its administration by incompetent persons. Just what might be considered competency in the administration of the double treatment is probably an open question. One thing is certain—the possession of a diploma from a veterinary college does not always answer the purpose. Again, I believe if competency is to be considered that laymen are certainly barred.

Recently I received a communication from a farmer in Maryland who wanted to know how he could learn to immunize hogs against cholera. I advised him to take a four-year course in a recognized veterinary college, and I believe that is the only way whereby he could properly be trained to handle hog cholera virus. Among other abuses of virus is its use in free territory; its use in sick herds without proper diagnosis; its administration without every precaution being taken to prevent the spread of the infection in case any of the animals should break; where, by its use, centers of infection might be maintained.

There is no doubt that centers of infection are not only started but maintained by the abuse of the double treatment, and this is certainly inconsistent with the principles of sanitation. An outbreak of hog cholera, even though it be started by virus which was obtained in a bottle, is just as dangerous to a locality as if the infection was introduced in any other way. Wouldn't it appeal to you that dissemination of the disease by abuse of the double treatment is an inconsistency, especially when we will not permit scientists in this country to experiment, even under ideal conditions, with foot-and-mouth disease virus?

The last and most expensive outbreak of foot-and-mouth disease, which the United States has experienced, made its appearance in the summer of 1914. The disease was spread from the Atlantic coast to the Pacific coast, and appeared in twenty states within thirty days. It must be admitted that this was wide-spread dissemination of the infection. It cost \$9,000,000.00 to rid the country of the malady. Many considered this an enormous cost, yet it was only approximately \$2.75 for each \$1,000.00 worth of cattle, sheep, and hogs on farms in the United States, January 1, 1915. Furthermore, the country has been free from the infection for eight years. Good business, wasn't it?

Figuring from the date of the 1914 outbreak of foot-and-mouth disease, hog cholera has to date cost the farmers of the United States in losses of hogs alone, over \$415,000,000.00. To this sum should be added another \$45,000,000.00, as a low estimate, of the amount spent on serum, virus, veterinary fees, control work, etc. This is approximately \$750.00 for every \$1,000.00 of hogs on our farms January 1, 1915. We certainly cannot pat ourselves on the back for the business sagacity we have exhibited in dealing with hog cholera.

As sanitarians and officials, we are charged with the responsi-

bility of protecting the swine industry. Therefore, are we justified in permitting ourselves to be held further accountable for these appalling losses? The answer is already asserting itself in the negative. This may be sensed in a measure by the growing sentiment in favor of the inauguration of eradication measures. Then again, because of dissatisfaction with present conditions, farmers and stock raisers in many localities are demanding a change. As is usually the case when dissatisfaction is rife, they do not know what is best for them, but they are clamoring to take in their own hands the only method of protecting their hogs which they have been taught. Such a procedure cannot be regarded hopefully, for the reason that it will necessitate their employing virus and serum, agents concerning which they know little.

The thought is, What are we going to do about it? I believe the following excerpt from a recent editorial in one of our leading stock journals will give food for thought along this line.

"Fortunately a large and growing section of the public which employs veterinary practitioners is beginning to regard these men as trained, competent and necessary aids in keeping valuable live stock in health. The prevention of diseases and the maintenance of health are now considered by leading breeders to be more useful as veterinary services than the treatment of diseases. Veterinarians, therefore, are being employed to advise and instruct stockmen in regard to animal sanitation and hygiene. An ounce of prevention is worth a ton of 'cures.' The best practitioners recognize this fact in their professional work, and their attitude challenges and evokes the hearty co-operation of enlightened breeders."

We have undoubtedly arrived at the parting of the ways on the hog cholera question. We have tried every method of controlling the disease, and heavy losses as well as dissatisfaction continue to be the results.

Let us take the term "Hog Cholera Control," transpose it and add the causative agent. We now have "Control of the Hog Cholera Virus." This is not only an entirely different proposition but the solution of the problem as well. By the application of the principles of sanitation, the prevention of the introduction, the harboring and the spread of the infection can be accomplished. By this method hog cholera can be eradicated as we eradicated foot-and-mouth disease. The plan is feasible, and the cost will be slight as compared with the enormous losses which the disease is causing.

BACTERIA OF THE GENITAL TRACT OF MARES AND THE SEMEN OF STALLIONS AND THEIR RELATION TO BREEDING EFFICIENCY¹

By W. W. DIMOCK and ETHEL SNYDER

*Department of Veterinary Science, Kentucky Agricultural
Experiment Station, University of Kentucky*

The bacteriological findings reported in this paper constitute an important part of the work done on a research project: "The Pathology and Bacteriology of the Reproductive Organs of Mares and Their Relation to Sterility," now under way at the Kentucky Agricultural Experiment Station. The findings are the result of cultural work on the reproductive organs of mares, the semen of stallions and the tissues of aborted fetuses and of foals that died during the first few days or weeks after birth.

The investigation was undertaken with full appreciation of its scope and complexity, and of the time, cost and diligent work required if results of a reliable, worthwhile nature were to be a reality. Much time has been given to culturing the genital tract of barren mares and the identification of the microorganisms isolated therefrom. Therefore, that part of the project dealing with the bacterial flora of the reproductive organs and related material, due to the nature of the work and abundance of available material, has advanced beyond any other.

To date, cultures have been made from the cervix and uterus of three hundred and five living mares; many of them have been under observation for two years, and have been cultured repeatedly with results which check exceedingly well and at the same time show the persistence of the infecting microorganisms, even in mares that have been under treatment. After checking the bacteriological findings with the appearance of those structures of the genital tract accessible for clinical study, it has been observed that the clinical pathology is in many cases indicative of the type of microorganisms that will be found upon bacteriological examination. Thus the mares fall into rather distinct groups, according to the bacteriological findings and the clinical picture which they present. The groups are as follows:

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

Group One: Those mares from which there was no bacterial growth on the medium inoculated and which, clinically, appeared to be carrying no infection in the genital tract. This group included one hundred fifty-three, or approximately fifty per cent of the entire number examined. The mares in this group may be subdivided into the following classes: (a) maiden mares; (b) mares that have been bred one, two, three or more seasons but failed to conceive; and (c) mares that have had foals, but have been barren for one or more years previous to the time of taking cultures. Classes (b) and (c), taken together, constitute a class of mares barren from various causes other than infection.

Group Two: Those mares from which a streptococcus was isolated from the cervix and uterus. This group includes eighty, or approximately twenty-six per cent of the entire number cultured. Fifteen of the eighty yielded a pure culture of a streptococcus. This group, although including only twenty-six per cent of the total number of mares studied, represents fifty-three per cent of the entire number found, on the basis of our examination, to harbor microorganisms in the cervix and uterus. They present by far the most serious problem in sterility with which we have come in contact. These mares, clinically, show unmistakable evidence of inflammatory changes, either acute or chronic in nature, often accompanied with greatly increased exudation, especially the chronic cases.

Group Three: The culture medium inoculated from the cervix and uterus of mares included in this group has shown, upon examination, two or more microorganisms. Seventy-one, or approximately twenty-three per cent of the entire number cultured, fall into this group. The mares were not entirely clean, as in group one, neither did they have, with possibly a few exceptions, the characteristic appearances of those showing acute or chronic inflammatory changes resulting from streptococcus infection as in group two. From six of these mares *Bacillus pyocyaneus* was isolated. After further study of these mares, it may be possible to separate them into rather distinct classes on a basis of the infecting agent.

METHOD OF TAKING CULTURES

The mare to be cultured is confined, the tail bandaged and held to one side, the external genitals washed with soap and water and rinsed with antiseptic solution. The speculum is inserted carefully into the vagina, adjusted and opened suffi-

ciently to permit a good view of the cavity. A flash light or an electric light may be used if artificial light is necessary. In the average or normal mare the os uteri will be nearly on a line with the lower prong of the speculum when held in a horizontal position. A five-inch platinum needle, attached to a twenty-inch holder, is used for taking the cultures; it is flamed, passed into the vaginal cavity and through the os uteri into the uterus and moved back and forth two or three times. Upon removing the needle successfully from the vaginal cavity, the tube of culture medium is inoculated. The practice has been to inoculate two tubes, taking fresh material for each. With a little practice, cultures can be taken in this way very accurately. Unfavorable surroundings should be avoided as far as possible, and every sanitary precaution observed. In case a mare does not stand quietly, or where an irregular or tortuous cervix is encountered, making it impossible to pass the platinum needle, the hand, protected by a surgeon's glove, may be used for collecting exudate from the uterus. The hand is inserted and withdrawn as carefully as possible, and the material collected and transferred to the culture tubes. We have in this way often secured quite as satisfactory results as from the use of the platinum needle. However, it is not to be recommended except in case of necessity.

For taking cultures in the field, agar slants have proved to be the most satisfactory and convenient form of culture medium to use. The medium is prepared from fresh beef, and contains one per cent of peptone and two per cent of agar, titrated to pH 7.6. This seems to be well adapted to the organisms encountered in this work. If properly prepared, the medium will be clear and transparent, thus making it possible to detect even the most minute colonies which may develop on the surface.

Inasmuch as the cultures are taken either in stables or out in the open, often under adverse conditions, such as dust and wind, it is evident that they can not always be free of contamination. The possibility of contamination has always been considered, and no doubt accounts for the occasional presence of such bacteria as *B. subtilis* and other spore-producing bacilli of a similar nature, together with numerous chromogenic micrococci, all of which are readily recognized as microorganisms whose natural habitat is that of air, dust, etc., and to which there has been no attempt made to give a specific identity, or to consider as factors in genital infections. However, considering

the hundreds of cultures that have been taken, it is only in comparatively few cases that such bacteria are found. On the other hand, certain organisms are recovered so consistently from the same mares that no doubt remains but that such bacteria have gained a foothold in the tissues and constitute an infection.

The following list includes those microorganisms that have been isolated from mares and identified:

<i>Streptococcus genitalium</i>	<i>Sarcina subflava</i> .
<i>Bacillus pyocyaneus</i> .	<i>Bact. pyogenes</i> .
<i>B. coli</i> .	<i>B. viscosus</i> .
<i>B. intestinalis</i> .	<i>B. subtilis</i> .
<i>M. pyogenes albus</i> .	<i>M. aureus</i> .
<i>M. viridis</i> .	<i>M. roseus</i> .
<i>B. alcaligenes</i> .	<i>M. candicans</i> .
<i>M. simplex</i> .	<i>M. citreus</i> .

In addition to these, several different bacilli belonging to the colon-typhoid group have been isolated. One of these bacilli, in particular, has occurred frequently. It is a short, thick rod, occurring singly and in pairs, is actively motile and does not stain by Gram's method. The colony on agar closely resembles that of *B. abortivo-equinus* in appearance. It is round and wrinkled at the center, with a pressed-out look at the edge, and when several days old is of such a consistency that the entire colony may be pushed intact over the surface of the agar.

Other bacilli encountered closely resemble *B. coli*, but differ from it in one or more characteristics. Some of the bacilli will no doubt prove to be organisms which have already been studied and isolated in other lines of research. However, others are disclosing characteristics for which we can find no description in bacteriological literature, and so are more than likely new and have yet to be classified and named.

The presence of the *Streptococcus genitalium* in the genital tract of mares has a very definite pathological effect upon the cervix and uterus. Inflammatory changes resulting from the presence of other microorganisms are far less distinct, and their relationship to sterility or barrenness has as yet not been determined.

Twenty-one mares have been killed and the reproductive organs studied post mortem. The ovaries, fallopian tubes, horns and body of the uterus were carefully cultured in each case. Five of this number were not cultured during life, while

the remaining sixteen were. From eleven no bacterial growth was obtained from any part of the reproductive system. Six of the ten, from which some growth was obtained, yielded either *B. coli* or *M. pyogenes albus* or both, from one or more organs, as shown in the accompanying chart. The other four showed a pure culture of *Streptococcus genitalium*. In one case it was obtained from the body of the uterus only, while in the other three cases it was isolated in pure culture from the body of the uterus and both horns. In one of these cases it was also obtained in a mixed culture from the bladder and the ureters, both organs showing extensive inflammatory changes.

Four of the mares that gave negative bacteriological findings upon post-mortem had been positive streptococcic mares during life. Cervicitis and metritis were also plainly evident. It is believed that bacterial growth failed to develop on the tubes inoculated from these mares, because of the condition of the medium used.

CHART SHOWING BACTERIOLOGICAL FINDINGS FROM TWENTY-ONE MARES
KILLED FOR POST-MORTEM

Mare	Right O.	Left O.	R. Tube	L. Tube	R. Horn	L. Horn	Uterus
717	<i>M. pyogenes albus</i>	<i>M. pyogenes albus</i>	—	—	—	—	<i>M. pyogenes albus</i>
767	—	—	<i>B. coli</i>	<i>B. coli</i>	—	—	—
768	<i>B. coli</i>	—	<i>M. pyogenes albus</i>	—	—	—	—
799	—	<i>B. coli</i>	—	—	—	<i>M. pyogenes albus</i>	—
1006	<i>M. pyogenes albus</i>	—	—	—	—	—	—
1041	—	—	—	—	—	<i>B. coli</i>	—
1532	—	—	—	—	—	—	<i>Strep.</i>
1479	—	—	—	—	<i>Strep.</i>	<i>Strep.</i>	<i>Strep.</i>
957	—	—	—	—	<i>Strep.</i>	<i>Strep.</i>	<i>Strep.</i>
1572	—	—	—	—	<i>Strep.</i>	<i>Strep.</i>	<i>Strep.</i>

Mares Nos. 806, 841, 893, 977, 1093, 1533, 936, 1515, 1560, 1655 and 918 were all negative bacteriologically upon post-mortem examination.

Cultural work on the semen of stallions has been confined very largely to semen collected in culture tubes directly from the urethra, following service. In a few instances cultures were made from the urethra of stallions before service and from the

urethra of a few geldings and young stallions that had not been in service. Although the stallions were all in good physical condition, several showed a considerable number of pus cells in the semen, and in one the pus cells were very numerous. This latter stallion revealed enlarged seminal vesicles upon rectal examination. A few were so-called "shy breeders," and the percentage of mares that conceived from service to them was decidedly below the average.

During the breeding season of 1922, February to June, inclusive, the semen of fourteen stallions was cultured. From twelve a streptococcus was isolated and identified as *Streptococcus genitalium*. No streptococci were found on the culture tubes from the other two stallions. During the breeding season of 1923, February to June, inclusive, the semen of twenty-six stallions was cultured. A streptococcus was recovered from twenty-four. Two were negative. *Streptococcus genitalium* was positively identified from twelve. From five the streptococcus isolated was not the *Streptococcus genitalium*. From seven no attempt was made to identify the streptococcus isolated. Six of the stallions cultured in 1923 had been cultured in 1922. The streptococci which did not prove to be the *Streptococcus genitalium* in some cases differed from it only in their ability to ferment carbohydrates, while others differed also in their action on blood.

Since January 1, 1923, twelve fetuses (nine aborted and three stillborn) and nine colts, the oldest of which was three weeks, have been studied. Of the twelve fetuses, *Streptococcus genitalium* was isolated from five; *B. abortivo-equinus* from one; while the bacteriological findings from the remaining six were negative. Of the nine colts, *Streptococcus genitalium* was isolated from five. A non-hemolytic streptococcus was obtained from the lung of one which was killed by accident, while the remaining three were so badly degenerated that contamination outgrew other organisms of importance that might have been present. The dams of three of the colts and fetuses from which *Streptococcus genitalium* was isolated were found, upon examination, also to be infected with the same organism. Two were cultured and found negative. No opportunity was afforded to obtain cultures from the other five. From five other mares that were cultured, following foaling, *Streptococcus genitalium* was obtained from each. Three colts from these mares were apparently normal; one colt

showed clinical evidence of "joint ill," but lived. The other died on the second day following parturition, but it was not cultured. Two of the mares that had apparently normal foals were bred on the ninth day but did not conceive, and during a later estrual period were cultured and found to be infected with a streptococcus. The other three mares were cultured on the sixth day following parturition, at which time *Streptococcus genitalium* was isolated.

BACTERIAL FINDINGS FROM FETUSES, COLTS AND DAMS

	<i>Streptococcus genitalium</i>	Non-hemolytic streptococcus	<i>B. abortivo-equinus</i>	No growth	Contamination	Total
Fetuses	5	0	1	6	0	12
Colts	5	1	0	0	3	9
Dams	3	0	0	2	0	5

CULTURAL CHARACTERISTICS OF THE STREPTOCOCCUS GENITALIUM

Hemolysis: On fresh blood-agar *Streptococcus genitalium* is actively hemolytic.

Morphology and Staining: This streptococcus consists of chained cocci, occasionally slightly elongated. The individual segments are usually equidistant, but sometimes are so arranged that they give the appearance of a chain of diplococci, end to end.

In preparations made from the exudate from the uterus and from the blood of experiment animals into which the streptococcus has been injected, the chains are short, seldom consisting of more than four or five elements. Grown on artificial media they form long, tangled chains of hundreds of elements in the water of condensation or in bouillon, but on the surface of serum agar the chains are short. They stain well with ordinary stains and are decolorized by Gram's method. No capsules have been noticed.

Isolation: The isolation of this streptococcus is comparatively easy as it grows well in the initial culture on plain beef-agar, and, if there is not too much other growth, the colonies are readily recognizable and can be picked off in pure culture.

Cultivation: *Streptococcus genitalium* grows best at 37°, and develops slowly or not at all at room temperature.

In order to be kept alive after the second generation, it must be transferred to a medium containing some serum. Luxuriant growth is produced on the beef-agar described above, to which has been added one per cent dextrose and ten per cent fresh, sterile horse-serum. It is necessary to draw serum and add it to the melted, cooled agar under absolutely sterile conditions, as the agar is not heated after the serum is added.

On agar slants, growth develops within twenty-four hours. The colonies are very small, ranging from an almost invisible speck to the size of a pin-head. They are slightly milky or clouded in appearance. On blood-agar plates, around each colony, is a clear zone of hemolysis. The colonies when scattered grow to the size of a pin-head, and when examined with a hand lens look somewhat like dewdrops. Sometimes a concentric ring is discernible, midway between the center of the colony and its outer edge. In gelatin-stab cultures no growth is visible.

In broth, to which has been added twenty per cent fresh, sterile horse-serum, there is abundant growth of a flocculent nature in the bottom of the tube, with a clear supernatant fluid above. This flocculent growth is composed of exceedingly long chains of cocci. Milk is slowly acidified but rarely coagulated.

Fermentation: *Streptococcus genitalium* ferments lactose and salicin, but fails to ferment mannit. No gas is produced.

Resistance: It is readily destroyed by heat or sunlight, and dies out within ten days unless transferred.

PATHOGENICITY TESTS

Streptococcus genitalium is not pathogenic for rats and guinea pigs, but is pathogenic for rabbits. Subcutaneous inoculations in rats, and subcutaneous, intraperitoneal and intravenous inoculations, together with feeding experiments, on guinea pigs, failed to produce any ill effects.

One-fourth cubic centimeter (approximately five billion organisms) of a virulent strain, injected intravenously, will kill a large rabbit in from twelve to thirty-six hours, depending on how recently it has been passed through an animal.

One cubic centimeter of the same culture, injected subcutaneously into a rabbit, does not kill, while the same amount given intraperitoneally, kills in from four to five days, and when fed, causes death in a week to ten days.

By accident, a healthy rabbit was allowed to eat on a rabbit that had just died from an injection of the streptococcus, and

so got some of the dead rabbit's blood. The second rabbit was dead in twelve hours, and the organism was recovered from its blood. This, of course, was a particularly virulent strain, as it had just been passed through several animals and was ingested without having been on artificial media since its passage.

Four different injections of a strain that had been in the laboratory for some time without animal passage were made in the neck of a mare. The injections consisted of one-half, one, two, and four cubic centimeters, given every two days. After the fourth injection, a swelling appeared at the point of injection, and a large running abscess developed, but healed up readily.

As a result of our bacteriological studies of the genital tract of barren mares, cervicitis and metritis, due to streptococcic infection, stand out as the most serious conditions to be dealt with. The streptococcus which we have isolated and studied is, from all available evidence, a distinct variety. When present in the uterus, it becomes an exceedingly persistent infection, characterized by inflammation and exudation. Upon clinical examination, the pathological picture presented is characteristic and distinct in many details, and in the very great majority of cases the clinical diagnosis will be confirmed by bacteriological examination. The lesions found upon post-mortem are equally distinctive. Therefore, when this streptococcus is considered from all angles—its cultural characters, its pathogenicity, its decided detrimental influence upon reproduction in mares, its presence in the semen of stallions and the part it plays as a factor in causing disease in fetuses and foals—it would seem to be sufficient to justify its designation by a specific name which so far as possible should signify its habitat and action in the animal body. It is believed that the name, *Streptococcus genitalium* meets this objective fully.

SUMMARY

1. Maiden mares and many barren mares apparently do not harbor microorganisms, in the uterus.

2. *Streptococcus genitalium* causes one of the most severe types of infection met with in the reproductive organs of mares.

3. Infection by *Streptococcus genitalium* results in a very characteristic type of cervicitis and metritis, usually terminating in sterility.

4. Mares harboring streptococcic infection frequently abort.
5. Colts carried full time by mares with streptococcic infection are often stillborn, die at birth or within the first few days or weeks from streptococcic infection.
6. *Streptococcus genitalium* is present in the semen of a large percentage of stallions examined.
7. Stallions harboring *Streptococcus genitalium* in their genital tracts may infect mares at the time of service.
8. Infection of mares at the time of service is probably dependent upon some predisposition.
9. *Streptococcus genitaliu* is often the principal infecting agent in navel ill, joint ill, peritonitis, and septicemia in very young foals.
10. In cases of abortion in mares, the differential diagnosis between contagious abortion, streptococcic abortion and accidental abortion is very essential.

DISCUSSION

DR. H. S. MURPHEY: In making the cultures, did you make more than one culture on different, successive days?

DR. DIMOCK: We always inoculated at least two tubes every time we examined a mare. In many cases we get our organism the first time. We considered that if we isolated a streptococcus on the first attempt that, when compared with the clinical condition, it was sufficient to warrant our assuming that this was the cause of the trouble.

On many mares, we went back as many as five times before we succeeded in finding a streptococcus. We went back that number of times because the case clinically suggested streptococcus infection, and yet we failed to get the organism until after many attempts. In some cases there was so much contamination that we were not sure that a streptococcus was there; in still other cases, where there was not contamination on the tubes, we apparently did not get the organism in the small amount of material secured on the needle.

There is another point, and it seems very peculiar in some ways, that in very chronic cases, while there was quite a quantity of exudate, our chance of recovering the organism was not as good as in the acute cases. It seems that in the acute cases the exudate contains the larger number of live organisms and that they grow readily, but in old chronic cases we frequently failed to find it; however, the clinical condition of the mare was such that we knew the organism must be there, and we would simply go back and repeat our inoculation until we found it.

DR. MURPHEY: Did you chart the time of any of these inoculations against the time in the estrous cycle, to know whether there was any correlation between the time of the cycle and the frequency of successful inoculations?

DR. DIMOCK: The mares carrying streptococcus infection show an excessive amount of secretion during the estrual period. During the interval, some of them would close up and appear to be nearly normal. I am speaking from memory, but I think that we do get the organism much more readily during the estrual period. We have not kept an accurate record on that point.

DR. MURPHEY: Mr. Chairman, I wondered if this might not come up, and I asked Dr. Rice's permission to use some unpublished data of his, simply because I think it has some relation to the question of securing infection from the genitalia.

In our work we used a speculum first, in the study of the estrous cycle,

and we had so much inflammatory reaction, and also from reagents, that we had to develop a technique of our own. That was given last year by Dr. Bemis, at the St. Louis meeting. We used a glass tube, lubricated by a slippery-elm-bark decoction. Dr. Rice made inoculations, step by step, in some of our early work, simply with the glass tube.

There is just one more thing that I want to state which seemed to me to be remarkable. During the first part of estrum, and until the heaviest of the flow, which is in post-estrus, the number of colonies increased rapidly. About three days after the post-estrous flow, the tract during the interval was nearly sterile, only an occasional colony would grow. Then, coincident with the beginning of the estrual flow, in what we have designated pre-estrus, the micro-organisms would increase.

It is evident that the genital flow is a factor in cleaning the genital tract in practically all of these cases.

DR. WARD GILTNER: Coming in late, I shouldn't discuss the paper, but I would like to ask if the paper shows sufficient evidence to make this organism a new species of streptococcus, and, in any case, I would like to suggest that we do not commit another crime against the rule of binomial nomenclature in giving this organism two specific names. I am sure Dr. Dimock, before publishing his paper, could coin a single specific name for the organism.

CHAIRMAN GOSS: There is one point that came up in this paper that I want to question. He refers particularly to the reaction of the culture media. I was wondering whether he had determined the reaction prior to sterilization or subsequently, as sterilization frequently changes the reaction considerably.

DR. DIMOCK: Answering Dr. Goss's question first, as stated in the paper, we do not sterilize the medium after we have added the horse serum. The medium is standardized before. The reaction is adjusted when the medium is made. It is then tubed, sterilized and the horse-serum is added, so that it is not titrated after sterilization.

CHAIRMAN GOSS: It is titrated prior to the addition?

DR. DIMOCK: Yes, sir.

CHAIRMAN GOSS: The question is, do you have much trouble in maintaining or getting your culture medium to that point of standardization? You have got to bring it to a certain point prior to sterilization. Can you maintain it during sterilization?

DR. DIMOCK: As I remember, we did not have trouble. The detailed cultural work was done by Miss Ethel M. Snyder, a very competent bacteriologist. I have been over these problems with her many times, and, while I am not as familiar with all the details as she is, I am sure she has never had trouble in controlling the reaction of the medium used.

There was one instance where we had used up the medium that had been tubed. Two or three mares were killed on short notice, and we had to go down to the cooler and take out for use culture medium that had been there some time. We did not run it through carefully, and we did not check it, as you say, after sterilizing. We did not get growth from these mares, and, as stated in the paper, they had been positive streptococcus cases before they were killed. We attributed the lack of bacterial growth to the condition of the medium, and we discarded it and made up some fresh and did not have further trouble.

I don't know that I ought to try to answer Dr. Giltner's statement. This streptococcus is different from any one that we have ever been able to find described in the literature, and, on that basis, we took the liberty to name it *Streptococcus genitalium*.

Ninety per cent of the silver fox pelts sold now are from ranch-bred animals.

One-fifth of the money spent for food is expended for dairy products.

A CHALLENGE TO THE VETERINARY PROFESSION¹

By PROF. H. BARTON *and* DR. R. L. CONKLIN,
MacDonald College, Quebec

It is a well known fact that the veterinary profession was born in a blacksmith shop. The village blacksmith, by virtue of his contact with horses and farmers, possessed an intimate knowledge and understanding of both that won respect for himself and confidence in his services. With the increasing density of population and the advancement in farming towards more intensive practice, the problems of live stock in health and disease soon developed an importance that demanded more treatment than the blacksmith could give. The call was then responded to by the "horse doctor" and a little later the professional agriculturist came to the aid of the farmer. Despite the joint interest of these two they traveled independently. Professional agriculture assumed the responsibility for agriculture as a whole and proceeded to establish itself upon a broad foundation of science and education. The "horse doctor" was gradually superseded by a man of more technical training, though not infrequently of less practical experience.

Thanks to our great pioneers, Andrew Smith, James Law and Duncan McEachran, veterinary practice was given the rank of a profession in North America. Through the energy and ability of these men it took its place in the field of study among the other sciences nearly three-quarters of a century ago. It was a healthy infant, born of good parentage, but because of strong competitors, destined to struggle for its existence. Notwithstanding, it made a normal early growth. The nature of its ambitions and the prevailing conditions made segregation more or less necessary for a time.

During the past fifty years, and particularly the last twenty-five, tremendous progress has been registered in all the sciences pertaining to agriculture. The veterinary profession may justly claim an appreciable contribution but perhaps we may ask ourselves to what extent the incentive has come from within and to what extent from without the profession itself. Has it, in itself, been the motive force in the elimination of the quack and blacksmith-horse doctor, who are not yet totally extinct? Has

¹Read before the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

it, to a man, striven to elevate the profession to the plane of its competitors? Have the veterinarians been seized with their responsibility to the live stock industry and have they been eager so to equip themselves that they could give the fullest and best service where opportunity offered? Or has the horse doctor been side-tracked by the progressive farmer himself, the profession been carried in too large a measure on the shoulders of other professions and the veterinarians content to secure a minimum of technical training, hang out a shingle or secure a stall, and proceed to earn a living?

The reason for our existence as a separate science is a laudable one, one of service of a high order, mercy to all helpless dumb creatures, protection of a great and vital industry, not to mention the human population. Are we living up to our opportunities and obligations? In the minds of some the answer may be debatable but to many the question is being asked. It may be worth while to examine ourselves briefly.

To take some things in the concrete: Since 1880 good progress has been made in the control and elimination of contagious and infectious diseases. Particularly noteworthy are the control and elimination of dourine from Canada, the elimination of the mange areas of the West, prevention of foot and mouth disease, rinderpest and Texas fever, the control of glanders and hog cholera. Recently the outstanding achievement has been that of the Health of Animals Branch in producing a serum which acts as a curative agent for glanders in man.

Educationally we have recently, but only recently, taken a step, which our sister profession took in 1904, and which, in view of the fact that many men have graduated in veterinary medicine who could not have qualified for entrance to agricultural colleges, would seem to have been unduly delayed.

In Canada alone we have approximately fifty-five million animals, valued at about four hundred and ninety million dollars, but with an annual loss from preventible diseases running into the millions.

The accredited-herd work is well under way, but tuberculosis is still taking its toll. This work has given the profession an opportunity and a boost, but it behooves the profession to leave no stone unturned in dealing with this comparatively new development. One aspect is its relation to the resident practitioner, who naturally suffers by the fact that an outsider undertakes to do something of which he apparently is incapable, and undertakes

to do it free. The time will come, probably, when the care of the herd as affected by this disease will revert to the home veterinarian and it would seem that the bridging of this gap might well merit early consideration. The test has been given a new standing, but that it has reached as satisfactory a station as it can be given would appear extremely doubtful. With such a golden opportunity for research, can it be said that full advantage of it is being taken.

And this suggests the question of research as a whole. In all the other professions, including agriculture, one hears much of research. To us, as it is to them, research is the fundamental stepping stone. And yet, in Canadian veterinary colleges, where research should center, there are no appropriations specifically for research, and there are no research staff members. Surely the responsibility must rest upon the profession. So long as we accept low standards of education and so long as we are content to have teaching staffs loaded with teaching and with no funds or assistance for research, we shall continue to suffer in comparison with other professions and to prompt the question already stated. Moreover we shall gradually be absorbed by agriculture, until what is left will be more segregated and helpless than ever. No one can question the merit and urgency of our case, but the objection of presenting it with sufficient emphasis devolves upon us. Professional agriculture, at the last annual meeting of its organization in Canada, placed itself on record in our support. Veterinary men cannot afford to rest until this imperative need is met. In every profession the status and point of view of the clientele must be given due regard. From the veterinary standpoint they are particularly important, because of the peculiarly close relationship between client and practitioner and, thanks to education, because of the progress in agriculture, as revealed in the attitude of the farmer as well as in his live stock practice. Whether such diseases as tuberculosis and abortion are becoming more widespread or not may be open to question, but among the farmers the appreciation of their seriousness is so much keener now than formerly that to them they seem more prevalent. Among live stock breeders one finds many well-informed men, men to whom even the most modern in veterinary practice is by no means foreign. Agricultural colleges have been training students and distributing them throughout the length and breadth of the United States and Canada for a period of nearly fifty years. There are now numerous institutions of agricultural

learning in these two countries and there is a huge organization of professional agriculture, engaged in professional work, all of which is either directly or indirectly having a bearing on the veterinary profession and demanding more of it.

Animal husbandry specialists, while not highly trained in veterinary science, are given some ground-work in it. They naturally have to do with animal problems, as they may be affected by health and disease. Many of them have opportunity for wide experience. They are in close touch with the live stock fraternity and hold positions of influence. Some of them have veterinary problems referred to them and while dealing with such is not their legitimate function, the fact that they receive them must be regarded, in some instances at least, as something of a reflection on the veterinarian. It may be argued that the explanation of this lies in the abundance of free advice that seems available. Undoubtedly there is truth in such a claim but the condition is one that the veterinarian should be able to meet. No animal husbandman of any standing wants to usurp the function of the veterinarian, but the veterinarian will do well to give the farmer and stockman more of what may be called general help, as it relates to his profession. He is too prone to content himself merely with the technical treatment of the case and to keep all explanation of cause and effect, and even of instructions, to himself. Were he better informed along general live stock lines, the health and disease questions, from a breeding standpoint, from a management standpoint, from a feeding standpoint, and from a housing standpoint, with all that they involve, he would be a more useful man to the farmer and more highly respected by him. It is not uncommon to find a veterinarian who so lacks even the lore of the old village blacksmith that he hardly knows how to approach a horse properly, something that the horseman is quick to discern.

Any contribution that the veterinarian may make by entering more fully into the farmer's position with him will prove a good professional investment. The highly skilled man, usually a specialist, perhaps can afford to be more independent, but invariably he is the man with the greatest fund of experience and the one most liberal with it. The average man too often depends entirely upon his operation or prescribed treatment for the popularity of himself and his profession. Nothing is to be lost, but everything is to be gained, by the enlightenment of the farmer.

The better informed a client may be, the more will he appreciate skill and ability.

Farmer psychology, often the product of circumstances, is as every successful practitioner can testify, somewhat different to that of certain other classes. If the veterinarian and the farmer are to be most helpful mutually they must understand one another. The veterinarian to the farmer ought to be more than a horse doctor, he ought to be a live stock specialist and a well informed citizen, ranking with the best in the community. The farmer to the veterinarian ought to be an associate, whose problems individually and collectively he shares, and a man whose knowledge of the live stock business he is interested in developing. Each has his counterpart to play and both are interested in a common prosperity.

The challenge to the veterinary profession today is higher standards, the production of highly-trained, broadly-developed men, who will persist as worthy students of a worthy calling and whose greatest problem shall be not so much the treatment of disease as security against it.

NEW BULLETIN ON BLACKLEG AND ITS PREVENTION

Immunization by vaccination is the only practicable and effective means of protecting animals against blackleg and eventually ridding pastures of infection, says the United States Department of Agriculture, in Farmers' Bulletin 1355, prepared by Dr. John R. Mohler, Chief of the Bureau of Animal Industry. This disease, which is found in all climates and altitudes, in practically all parts of the world, is the cause of great losses in this country, particularly in the great cattle raising and feeding sections of the West. In the new bulletin all of the important information on this disease has been brought together in concise form. The various methods of protecting animals against blackleg by vaccination are described. Formerly the Department of Agriculture manufactured and distributed blackleg vaccine, but, as a result of an act of Congress, this distribution was discontinued, beginning July 1, 1922.

Copies of the bulletin may be had, as long as the supply lasts, by writing to the Department of Agriculture, Washington, D. C.

THE BACTERIOLOGY OF PROGRESSIVE PNEUMONIA OF SHEEP*

By HADLEIGH MARSH

Montana Livestock Sanitary Board Laboratory

In a previous article,² I have described a progressive pneumonia of sheep which occurs to a very considerable extent among the sheep of Montana and other northwestern states. The question of the etiology of this condition was not discussed to any extent at that time. However, we were convinced of the infectious nature of the disease, and feel that we have now accumulated sufficient data to warrant us in publishing a report on the bacteriology of this pneumonia. The etiology of the disease has not been definitely established, as the experiments which have been carried on in cooperation with Dr. Howard Welch, of the Montana Agricultural Experiment Station, are not yet complete, but we have studied an organism associated with the disease which we believe to be the primary bacteriological factor. The absolute proof of the causal relationship of any organism to this disease is very difficult and time-consuming, due to the low type of virulence of the organism and the slowly progressive nature of the disease. It is also almost impossible to reproduce experimentally the conditions which may be predisposing factors in the case of range sheep.

The bacteriology of progressive pneumonia in sheep has been under investigation in this laboratory for the last three years, as time and opportunity were available. We have studied the lungs of twenty field cases of the disease, and eight cases in which the diagnosis was made on the killing floor of the packing-house. In connection with the study of definite cases of this disease, we have also examined fourteen sets of normal lungs from bunches of sheep showing no signs of this condition, and five sets of apparently normal lungs from sheep which came from a ranch where there were many "lungers."

We did not find many species of bacteria in either the normal or diseased lungs. In the lungs from diseased sheep, there were three bacteria which were most frequently found, and in most cases either one, two or three of these species were found to the

*Read before the Idaho Veterinary Medical Association, Idaho Falls, Idaho, August 20-21, 1923.

exclusion of any other bacteria. In three of the twenty-eight sets of lungs the cultures were unsatisfactory, and in two cases the cultures were negative, remaining sterile. The three organisms found most frequently in the twenty-three remaining cases were a diphtheroid bacillus, in sixteen cases; *Pasteurella ovisseptica*, in fourteen cases; and a gram-negative diplococcus, which was probably *Micrococcus catarrhalis*, in six cases. In four of these cases the diphtheroid bacillus was recovered in pure culture, and in three cases the pasteurella was recovered in pure culture.

In the fourteen sets of supposedly normal lungs examined there was a somewhat more varied flora, but the diphtheroid bacillus was recognized in only one of these cases, and the pasteurella was not definitely identified in any of them, although several showed a Gram-negative cocco-bacillus which may have been a pasteurella.

In three of the five sets of apparently normal lungs from sheep which came from a ranch where this disease existed, the diphtheroid bacillus was found, and in two cases the pasteurella was identified.

In addition to the lungs from the "lunger" and normal sheep, bacteriological examination was made of the lungs of a lamb infested with stomach worms and lung worms. From these lungs we obtained a pasteurella and a diphtheroid bacillus. The pathological appearance of these lungs was similar in some respects to that of lungs from "lunger" cases.

Due to the fact that either the diphtheroid bacillus or the pasteurella, or both, were quite constantly present in cultures from "lunger" lungs, and were rarely found in presumably normal lungs, our attention has been centered on these two organisms. The diphtheroid organism caught our attention in the first set of lungs examined bacteriologically in the Montana Livestock Sanitary Board Laboratory. This was because these lungs contained several small abscesses similar to those found in cases of caseous lymphadenitis found in the packing-houses, and smears from the abscesses showed a bacillus which we did not at that time distinguish from the Preisz-Nocard bacillus. A little later we isolated the same organism from another typical "lunger," in which no abscesses were found. For comparison with these cases, a set of lungs was sent to us from a packing-house, in Butte, which was taken from a sheep which was diagnosed as showing lesions of typical caseous lymphadenitis.

These lungs showed abscesses containing a smooth, thick, greenish pus, and a pneumonic condition which was slightly different from that seen in the "lungers" which we had examined up to that time. From the abscesses in these lungs we isolated a diphtheroid bacillus which was apparently identical in every way with the one found in the "lungers."

In order to have a proper standard of comparison bacteriologically, we obtained cultures of three strains of the Preisz-Nocard bacillus from the Pathological Division of the U. S. Bureau of Animal Industry. These were easily distinguished from the organisms which we had obtained from the "lungers" and from the supposed typical case of caseous lymphadenitis from the packing-house. Later we examined bacteriologically the lungs from a case of caseous lymphadenitis which we saw killed in the packing-house. This case showed caseous body glands, as well as enlarged mediastinal glands filled with greenish, caseous material, and numerous encapsulated abscesses in the lungs. The lungs in this case were apparently normal outside the pus foci. From the lesions we isolated the true Preisz-Nocard bacillus in pure culture.

It appears, therefore, that the pneumonia which we are studying is distinct from caseous lymphadenitis, although cases in which abscesses occur might easily be confused with caseous lymphadenitis. Although the thoracic lymph glands show pathological changes in progressive pneumonia, we have never seen in them the lesions characteristic of caseous lymphadenitis. In only one of these cases have we seen a similar condition in any lymph gland. In Sheep No. 290 one of the precrucial lymph glands was much enlarged, and most of the gland tissue had been replaced by a white caseous material, in which we found the diphtheroid bacillus in smears.

In this connection it is noteworthy that R. S. Spray,⁴ of the University of Chicago, in a recent publication, describes a diplococcus, which may be the same organism which we have called a diphtheroid bacillus, which he has isolated from the glands and lungs of sheep showing lesions of caseous lymphadenitis.

During the time in which we have been studying this pneumonia, we have isolated three strains of a diphtheroid bacillus apparently identical with those isolated from "lunger" sheep, from lung lesions in two cows and one hog. If these were considered independently, we would have described the infective

agent as *Bacillus pyogenes*, and it may be that the organism from "lungers" should be considered as that species. In the hog lungs from which we recovered this organism, there were abscesses identical with those found in the sheep. The hog in this case came from a ranch where there were a number of cases of progressive pneumonia in sheep, and from which we had obtained three of our sheep strains of the diphtheroid bacillus.

METHODS OF CULTIVATION

Six of the sets of lungs examined were from sheep which had been held under observation at the laboratory. In these cases the lungs were removed from the sheep immediately after death, and cultures made. All other lungs were shipped to the laboratory packed in borax. Cultures were made in general from three places: the bronchial exudate, abscesses, if any, and from the cut surface of the lung tissue. In the latter case, the surface was seared, a deep cut made with a sterile knife, and the cut surface scraped with a sterile knife. In several cases cultures were also made from the mediastinal lymph glands, with negative results in every case.

The media used were plain broth, serum-broth, and serum-agar. The broth and agar used in this laboratory are the "hormone" media. The diphtheroid organisms were rather difficult to grow on the original cultures, and it is very probable that we failed to cultivate them in some cases where they were present. They were also very difficult to isolate where they were not obtained in pure culture.

In some cases animal inoculation with the original material was resorted to, using guinea pigs and rabbits. Where the pasteurella was present, the inoculation of guinea pigs always resulted in death, usually within twenty-four hours.

DIPHTHEROID BACILLUS

Morphology. The morphology of the different strains of diphtheroid bacilli studied varied so much that it has been a question whether to consider them as belonging to one species. They show all the forms described as occurring in cultures of *Bacillus pyogenes* by Brown and Orcutt.¹ As a rule, however, any one strain has not varied in general type to any great extent. Certain strains have shown the distinctly diphtheroid type through many generations on artificial media, and others have never shown this type, but have consistently shown short bacillary and coccoid forms. However, all the strains are some-

what pleomorphic, and some have shown a change from the diphtheroid to the coccoid form. Where observed in the tissues or in bronchial exudate, the short bacillary form has been predominant, even in strains which have been constantly diphtheroid in type in artificial media. The length of the bacillus varies from 0.5 to 1.0 μ , and the width is about 0.5 μ .

Some strains showed a predominance of the streptococcus form the chains being a succession of diplococci.

All the strains are non-motile. The most satisfactory stain has been Gram's stain. The bacillus is Gram-positive. In the diphtheroid and fusiform forms, a considerable portion of the cell does not retain the violet stain, leaving the Gram-positive portions appearing as deeply stained granules. In the coccoid forms there often appears to be a light-staining capsule or matrix surrounding and connecting the individuals. There is a tendency both in the tissues and on artificial media to occur in clumps.

Cultural Characteristics. We have found serum-agar the best medium on which to carry our strains. Original isolations have been made either on serum-agar, or in broth or serum-broth. The growth on plain agar is very scanty. On original isolation on serum-agar, the growth appears after about forty-eight hours as very small, round, smooth, discreet, colorless colonies. Some growth usually appears first in the condensation water, and there is a tendency for a thin film of growth to extend from the condensation water between the medium and the wall of the tube. On subcultures there is a delicate, almost colorless, diffuse growth, which has a characteristic granular appearance. The growth on artificial media never becomes heavy.

In plain broth or serum-broth, there is a slight cloud, which, on close examination, has a granular appearance, due to agglutination, and gradually settles to the lower portion of the medium, leaving the upper portion of the fluid comparatively clear.

On blood-agar this organism produces hemolysis. The colonies on blood-agar plates are from 0.5 mm. to 1.0 mm. in diameter. The majority of the strains showed a zone of complete hemolysis about the width of the diameter of the colony.

An attempt has been made to determine the fermentation reactions of twelve strains, including several strains isolated from other sources than sheep lungs, on twelve carbohydrates. There was difficulty in getting decisive results, due to the fact that the growth is so scanty in ordinary broth. We did not have

success in enriching the medium with serum, as the serum had the effect of decolorizing our indicator, which was brom-thymol blue. An efficient medium for fermentation tests has not as yet been worked out, and a report on these reactions will be reserved for later publication.

However, in one test involving only four strains, we obtained fairly good results. In this test we obtained definite acid production with all four strains in dextrose, saccharose, lactose, maltose and xylose. In inulin, mannit, salicin, dextrin, glycerin, dulcitol and arabinose, the results were inconsistent. As far as the carbohydrates in which we obtained definite and consistent acid production are concerned, our reactions agree with those reported by Brown and Orcutt for *Bacillus pyogenes*, and by Spray for the diplococcus which he isolated from lesions in sheep pneumonia. Brown and Orcutt report for *Bacillus pyogenes* acid production in four sugars—dextrose, saccharose, lactose and xylose. They did not use maltose. Spray reports for the diplococcus acid production in dextrose, saccharose, lactose, xylose and maltose.

Pathogenicity. Pathogenicity tests on laboratory animals have not been carried out systematically on a large number of strains, but we have data on twenty rabbits and six guinea pigs, and five rabbits inoculated with similar organisms isolated from other sources. The table shows the results of the inoculations with tissue and cultures.

Four inoculations were made with lung tissue, two into rabbits and two into guinea pigs. Both the guinea pigs and one of the rabbits died with pasteurella infection. Rabbit No. 8, which was inoculated subcutaneously, did not develop pasteurella infection, and showed only local lesions in the mammary gland, where the same type of pus formation occurred, as is found in the arthritis cases which resulted from inoculations with cultures of the diphtheroid bacillus.

Four inoculations were made with mixed cultures made directly from the original material, using two rabbits and two guinea pigs. The rabbits were inoculated intravenously, and the guinea pigs intraperitoneally. Both guinea pigs and one of the rabbits died of pasteurella infection. The other rabbit died in nine days, apparently due to infection with the diphtheroid bacillus. A local abscess developed at the point of inoculation, from which the diphtheroid bacillus was recovered.

Nearly all the work with pure cultures has been with rabbits. Only two guinea pigs have been used. One received a subcutaneous injection of a culture of Strain 186, which produced only a local lesion. The other received an intraperitoneal injection of a culture of Strain 339, with negative results.

Sixteen rabbits have been inoculated with cultures of the diphtheroid bacillus from "lunger" sheep, and five have been inoculated with cultures of similar diphtheroids isolated from other sources. The lunger strains were isolated from eight different sheep, and five rabbits were used for four strains isolated from other sources.

One rabbit received an intrathoracic injection, and died in two days with an acute pneumonia and pleuritis. Intratracheal injections were used in five rabbits. Rabbit No. 3 was given one intratracheal inoculation with a culture of Strain 186, and died after six months, with a chronic pneumonia. The diphtheroid bacillus was recovered from the lung. Four rabbits were given intratracheal injections of cultures of Strain 290, Rabbit No. 33 receiving seven inoculations at intervals of several days, and Rabbit No. 23 receiving six inoculations. The results in these four cases were negative. Rabbit No. 2 received a subcutaneous inoculation, and developed only local lesions, appearing at the point of inoculation and on the scrotum.

Eight rabbits received intravenous inoculations with cultures of five different strains. Negative results were obtained in two cases. Five developed an arthritis in the stifle, hock or shoulder joints, usually showing a systemic reaction as well. One showed a systemic effect with no apparent local lesions. One of these died after ten weeks, one was destroyed in a greatly emaciated state, and the others recovered. On post-mortem examination, one of the rabbits inoculated with Strain 186 showed small white areas in the kidneys in which the diphtheroid bacillus could be demonstrated.

Of the five rabbits inoculated with similar organisms from other sources, Nos. 59 and 64 received cultures of Strain 722, which was isolated from the pneumonic lung of a cow. Rabbit No. 59 died in thirteen days. The only lesions found on post-mortem examination were white areas in the kidneys, in which the diphtheroid bacillus was demonstrated. Rabbit No. 64 showed a systemic reaction, and after five weeks developed partial paralysis of the hind quarters. No. 63 received a culture of a diphtheroid recovered from the lung of a calf. This rabbit

died in five weeks, after developing total paralysis of the hind quarters. The only lesion found on post-mortem examination was a small pus focus on the muscles between the ischial tuberosity and the coccyx. Cultures from this lesion developed the diphtheroid bacillus in pure culture. No. 65 was inoculated with a culture of a diphtheroid recovered from the lungs of a hog, which came from a farm where there were "lunger" sheep. After six weeks this rabbit was completely paralyzed in the hind quarters. Nos. 64 and 65 were killed at six weeks, and both showed necrotic lesions in the bodies of the last two lumbar vertebrae, destroying the joint between the two vertebrae. Pure cultures of the diphtheroid bacillus were isolated from the lesions in both cases. No. 66 received a culture of a diphtheroid isolated from cow's milk.

This organism is apparently of a low type of virulence for rabbits, as most of them recovered from the infection. The most constant effect of inoculation of rabbits was the formation of characteristic pus foci, in the leg joints following intravenous inoculation, and at the point of inoculation in the case of subcutaneous inoculation. During the active stage of these abscesses, the pus was of the consistency of egg albumen and white in color, and the diphtheroid bacilli could be demonstrated in large numbers in the pus. Later the pus became thicker, but remained smooth and white, and the living organisms could not be found in it. In some of the recovered cases the joint lesions disappeared completely. In one rabbit, in which the record is incomplete as to the method of inoculation, several large abscesses were found on the mesentery. The diphtheroid bacillus could be recovered from these pus foci in pure culture, but later the organisms died in the abscesses, and no cultures could be obtained from those rabbits which made an apparent recovery.

EXPERIMENTS WITH SHEEP

A cooperative arrangement was made with Dr. Howard Welch, of the Montana Agricultural Experiment Station, at Bozeman, for carrying on inoculation experiments with sheep. Nine sheep were obtained from the Station flock, which was known to be free from the "lunger" disease. These sheep were of various breeds and ages, and included both ewes and wethers. Eight of these sheep were divided into two lots of four each. The ninth was used as a control. Lot No. 1 was used for inoculations with two strains of the diphtheroid bacillus, and lot

TABLE I

INOCULATIONS WITH PURE CULTURES OF DIPHTHEROID BACILLI

Strain	Animal		Method of Inoculation		Result
186	Rabbit		Intravenous	Arthritis.	Systemic reaction. Recovered.
186	Rabbit		"	Arthritis.	Systemic reaction. Killed after 19 days. Kidney lesions.
186	Rabbit	5	"	Negative.	Culture used was a broth culture 3 weeks old.
254	"	19	"	Systemic reaction.	Recovered.
R-1	"	61	"	Arthritis.	Systemic reaction. Died in 2½ months.
R-3	"	58	"	Negative.	
R-4	"	60	"	Arthritis.	Recovered.
R-4	"	62	"	Arthritis.	Recovered.
186	"	1	Intrathoracic	Acute pneumonia.	Died in 2 days.
186	"	2	Subcutaneous	Local lesion.	Lesion on scrotum.
186	"	3	Intratracheal	Chronic pneumonia.	Died in 6 months. Diphtheroid recovered.
290	"	33	"	Negative.	
290	"	36	"	Negative.	
290	"	23	"	Negative.	
290	"	41	"	Negative.	
448	Rabbit				Abscesses on mesentery.
186	Guinea pig		Subcutaneous	Local lesion.	
339	"		Intraperitoneal	Negative.	

INOCULATIONS WITH PURE CULTURES OF DIPHTHEROID BACILLI FROM SOURCES OTHER THAN "LUNGER" SHEEP

722	Rabbit	59	Intravenous	Died in 13 days.	Kidney lesions.
722	"	64	"	Systemic reaction.	Paralysis of hind-quarters. Killed at 6 weeks. (Lesions in lumbar vertebrae.)
714	"	63	"	Systemic reaction.	Paralysis of hind-quarters. Died in 5 weeks.
788	"	65	"	Systemic reaction.	Paralysis of hind-quarters. Killed at 6 weeks. (Lesions in lumbar vertebrae.)
915	"	66	"	Systemic reaction.	

INOCULATIONS WITH ORIGINAL TISSUES

175	Guinea pig		Intraperitoneal	Died.	Pasteurella infection.
281	"		"	Died.	Pasteurella infection.
281	Rabbit	8	Subcutaneous	Local lesions in mammary gland.	
281	"	10	Intrathoracic	Died in 2 days.	Pasteurella infection.

INOCULATIONS WITH ORIGINAL MIXED CULTURES

186	Rabbit		Intravenous	Died in 9 days.	Lesion at inoculation point.
254	"	18	"	Died in 4 days.	Pasteurella infection.
452	Guinea pig		Intraperitoneal	Died in 48 hours.	Pasteurella infection.
631	"		"	Died in 11 hours.	Pasteurella infection.

No. 2 was used for inoculation with two strains of the pasteurella. For each strain one sheep received a salt solution suspension of the growth on a serum-agar slant, and one received a broth culture. The amount of material inoculated was 5 cc in every case, and the injections were made into the trachea. Ten inoculations were made at weekly intervals. Each time the inoculations were made, 5 cc of sterile broth were inoculated intratracheally into the control sheep.

These inoculations were started on June 29, 1922, and continued for ten weeks. The sheep were then held awaiting developments. They were kept in two small open lots, with sheds in one corner for shelter, and fed a maintenance ration of hay. On January 10, 1923, the sheep were carefully examined by Dr. Welch and the writer, and no symptoms of any kind could be recognized. It was decided to kill one sheep from each lot, in order to determine whether any pathological changes had taken place.

From the lot inoculated with the diphtheroid, we killed Sheep No. 1457, which had been inoculated with a broth culture of Strain 290-C. It was killed by bleeding from the jugular vein and carotid artery. Post-mortem examination showed the sheep to be in excellent condition. No abnormalities of any kind were found, outside of the lungs. The lungs appeared perfectly normal, except for one small area of consolidation about 1 cm. in diameter at the posterior border of the diaphragmatic lobe of the left lung. This area had the same appearance as the consolidated portions of the lungs of "lunger" sheep. Sections of the consolidated area showed a pathological condition similar to that found in clinical cases of progressive pneumonia. In the air-containing lung tissue surrounding the consolidated nodule, there was perivascular and peribronchial infiltration with small mononuclear cells. The capillaries were engorged. In places there was infiltration of small mononuclear cells into the walls of the alveoli. The nodule at the center of the area consisted of a mass of small mononuclear cells. A bronchiole on the border of the nodule was filled with pus cells.

Cultures were made from the mucosa of the bronchi and from cut surface of lung tissue. Diphtheroid bacilli predominated in the growth in cultures from the bronchi. A few diphtheroid bacilli were demonstrated in material from the cut surface of the lung.

From the lot inoculated with pasteurella cultures, we killed Sheep No. 148, which had been inoculated with broth cultures of Strain 452-B. Post-mortem examination showed the sheep to be in excellent condition, and all organs, including the lungs, were apparently perfectly normal. Cultures were made from the mucosa of the primary bronchi, and from the cut surface of the lung tissue. The lung cultures remained sterile. Some growth occurred in the broth tubes from the bronchi, and smears showed the predominating organism to be a diphtheroid bacillus,

the presence of which was not accounted for by the conditions of the experiment.

The remaining six sheep were held under the same conditions as before. In April it was noted that one of the sheep in the diphtheroid lot showed slight symptoms of respiratory disturbance. At shearing time, in June, the same sheep was noticed by the shearer as showing the characteristic respiration of a "lunger." On July 12, 1923, a year after the inoculations were started, this sheep was killed. At this time we considered that her respiration was abnormal. She was in good condition, but not quite so fat as the other sheep. She was killed by bleeding, and post-mortem examination made immediately. There was nothing abnormal outside the respiratory system. At the point of inoculation on the trachea there was an abscess about the size of an egg. This was beneath the serous coat, and did not involve the mucosa. It contained a smooth, thick, viscid pus, having a greenish color. This pus was similar to that found in abscesses which occur in clinical cases of progressive pneumonia. The lungs appeared normal at first glance, but they were not as bright pink as usual, and showed indications of a slight interstitial infiltration. They were not perfectly elastic, and did not collapse as much as a normal lung usually does. There was an abscess about 2 cm. in diameter just beneath the pleura on the mediastinal face of the diaphragmatic lobe of the left lung. This abscess had a thick connective tissue capsule, and contained a smooth, thick, viscid, greenish pus, like that in the abscess on the trachea.

Smears from the trachea abscess showed the diphtheroid bacillus in pure culture. Smear from the lung abscess was negative. Cultures from the trachea abscess developed the diphtheroid bacillus in pure culture. Cultures from the lung abscess developed a *pasteurella* in pure culture. My cultures from the cut surface of the lung tissue remained sterile, except for one tube which developed a *staphylococcus*. Duplicate cultures were made by Dr. W. J. Hall, of the Experiment Station, who recovered the diphtheroid bacillus on cultures from the lung tissue.

Sections of the lung of the sheep showed the early stages of the pathological condition which is characteristic of progressive pneumonia of sheep. There was a marked peribronchial infiltration with small mononuclear cells, and an infiltration of the same type of cells into the walls of the alveoli.

It is obvious that up to date the sheep experiments have produced no conclusive results, and that we have not yet succeeded in producing a typical case of progressive pneumonia. However, the small results thus far obtained have pointed to the diphtheroid bacillus as a causative factor, and, in view of the findings of the clinical cases studied, we feel justified in considering this organism as the primary bacteriological factor in this condition. When the sheep experiments were started, it was thought that either the diphtheroid or the pasteurella might prove to be a primary factor, but thus far no effect whatever has been observed from intratracheal inoculations of the pasteurella, although the strains used were tested at the time the experiments were started, and were very pathogenic for guinea pigs. All the pasteurella strains isolated from "lunger" cases killed guinea pigs in a short time, usually less than twenty-four hours, and, in view of the constancy with which this organism was found, in several cases in pure culture, it was considered very likely that this bacillus would be found to be the primary etiological factor. Finding the pasteurella in pure culture in several cases is not necessarily significant, as the diphtheroid is often difficult to isolate, and might have been present and overlooked.

Dr. Welch, of the Experiment Station, who is carrying out the sheep experiments in cooperation with the Livestock Sanitary Board Laboratory, concurs with me in associating the diphtheroid bacillus with this disease as a primary factor. In view of the necessary length of time consumed in these experiments, we thought it advisable to publish our results up to date, and it is our intention to carry the experiments further and to record our results in a complete and detailed joint publication.

GENERAL DISCUSSION

In the study of any disease it must be realized that the question of its etiology involves more than the mere bacteriology of the condition, even though it is definitely infectious, and can be shown to be immediately due to a specific organism. This is especially true of a chronic conditions due to an organism of comparatively low virulence, as we believe is the case in progressive pneumonia of sheep. In this case we have made a fairly thorough study of the bacteriology of the condition, and have found quite constantly associated with this pneumonia a diphtheroid organism which we believe to be the primary bac-

teriological factor. However, we do not know definitely the predisposing factors which make affected sheep susceptible to the infection. The slowly progressive nature of the disease makes experimental proof very difficult, as well as the fact that it is practically impossible to reproduce experimentally the conditions under which range sheep become affected.

It is our opinion that the immediate cause of this condition is bacterial infection, but that the predisposing condition is the manner in which sheep are handled. This condition, as far as we know, has been recognized only in the northwestern range states. Dr. Welch states that the small farm flocks in the Galatin Valley are practically free from the disease, while range sheep in the same general section of the country are affected to a large extent. It seems reasonable to assume that the great exposure of the range sheep to irritation of the respiratory tract would render them susceptible to any invader that might be introduced into the lungs. During shearing time, and when sheep are being trailed to and from summer ranges, they inhale large amounts of dust, especially in localities where it is necessary to drive considerable distance in lanes. Sheep are usually "snotty-nosed" when being handled in this manner, and the catarrhal condition of the mucous membranes of the respiratory tract would make the sheep susceptible to infection with organisms which are widely distributed, as is the case with the members of the diphtheroid and *Pasteurella* groups.

CONCLUSION

Our study of progressive pneumonia of sheep has led to the conclusion that its immediate cause is infection with bacteria of a low type of virulence, and that the principal predisposing factor which makes a certain percentage of the sheep susceptible to the infection, is the large amount of irritation of the respiratory tract to which sheep are subjected under present conditions in the handling of range sheep.

We have found two organisms quite constantly associated with this condition—a diphtheroid bacillus and *Pasteurella oviseptica*. From the findings in clinical cases of the disease, and from the animal experiments which have been carried on up to the present time, we believe that the *Pasteurella* is a secondary invader, and that the primary bacteriological factor in the etiology of the disease is the diphtheroid bacillus which we have described. The morphological and cultural character-

istics of this bacillus, as far as they have been determined, and its pathogenic effect on laboratory animals correspond very closely to the description of *Bacillus pyogenes*, as given by Brown and Orcutt.¹ It also seems probable that the organism described by Spray^{3,4} as a diplococcus, which he has isolated from pneumonic lungs of sheep, may be the same organism which we have described as a diphtheroid bacillus.

This investigation is not complete, and will be carried further. Due to the slowly progressive nature of the disease, it will take several years to complete the animal experiments, and it is our intention to make a more complete report at a later date.

REFERENCES

- ¹Brown, J. H. and Orcutt, M. L.: A study of *Bacillus pyogenes*. (1920) Jour. Exp. Med., xxxii (2), p. 219.
²Marsh, Hadleigh: Progressive pneumonia of sheep. (1923) Jour. Amer. Vet. Med. Asso., lxii, N. S. 15 (4), p. 458.
³Spray, R. S.: Bacteriologic study of pneumonia in sheep. (1923) Jour. Inf. Dis., xxxiii (1), p. 97.
⁴Spray, R. S.: A diplococcus associated with caseous lymphadenitis and pneumonia of sheep. (1923) Jour. Inf. Dis. xxxiii (2), p. 161.

ARMY MEDICAL CENTER ESTABLISHED AT WASHINGTON, D. C.

On August 31, 1923, the War Department published an order designating the Walter Reed General Hospital Reservation, in Washington, D. C., as the Army Medical Center. The change marked the establishment of the Army Medical School in its new half-million dollar building, and also the removal of the Army Veterinary School from Chicago, Ill., to Washington.

As now constituted the Army Medical Center includes the Walter Reed General Hospital, the Army Medical School, the Army Veterinary School, the Army Dental School, and the Army School for Nurses. At a later date it is contemplated that buildings will be provided to house the Army Medical Museum and the Surgeon General's Library at the Center.

The new Army Medical School building is a fine, four-story, brick and stone structure, well situated on one of the highest points on the reservation. Its offices, laboratories and classrooms present all that is modern in arrangement and equipment. The Veterinary Laboratory Section of the Army Medical School, in charge of Capt. R. A. Kelser, V.C., occupies a suite of five rooms on the second floor of the new building.

Colonel Weston P. Chamberlain, M.C., is Commandant of the Army Medical School. The Army Veterinary School is under the command of Lieut. Col. William P. Hill, V.C.

NOTES ON THE TREATMENT OF FOXES WITH CARBON TETRACHLORIDE, AND THE USE OF SOFT ELASTIC GLOBULES FOR PREVENTING INHALATION-COLLAPSE *

By KARL B. HANSON and H. L. VANVOLKENBERG

Bureau of Biological Survey, U. S. Department of Agriculture

Recent work has successfully demonstrated the efficiency of chemically pure carbon tetrachloride (CCl_4) for the removal of hookworms and ascarids in smaller domestic animals, especially dogs.

Hall,¹ who discovered the efficacy of the drug as an anthelmintic in sufficient doses, administered it to 9 dogs at the rate of 0.3 cc per kilogram of body weight. The drug removed 34 hookworms and 6 ascarids, leaving none, thus showing an efficiency of 100 per cent in each case. He found it less effective administered in a drench, and concluded that for the best results it should be given in capsules.

Allen² gave the drug at the rate of 0.3 cc per kilo to 23 foxes, 13 of which were infested with hookworms. The dose expelled 79 and left 6, an efficiency of 93 per cent. His published data show that 6 of the foxes were infested with ascarids. The dose removed 10 and left 3, an efficiency of 77 per cent.

In percentage efficiency tests which the writers made on 30 foxes, this drug was as effective in the removal of hookworms and ascarids as it was found by Hall and Allen. In addition, it was found to be 100 per cent effective in the removal of intestinal flukes. Detailed data on these experiments will be published in a later paper.

Two advantages of carbon tetrachloride as an anthelmintic are that a purgative is not necessary and that the drug does not have to be given in divided or repeated doses. Thus only one catching and one administration are necessary in each treatment, a factor of practical importance in the treatment of foxes.

As in the treatment with other anthelmintics, food was withheld at least twelve hours previous to and two or three hours following the administration of the drug.

INHALATION-COLLAPSE

It was our experience that most of those foxes which suddenly inhaled carbon tetrachloride, or its fumes, as a result of capsules dissolving or breaking in the mouth, quickly manifested an intoxication, characterized by collapse.

This inhalation-collapse apparently was a paralysis of the medullary centers, first affecting the respiratory action and causing asphyxia. Respiration ceased almost immediately after a few convulsive movements or spasms of the muscles, especially those of respiration. The pupils were dilated, the body became first stiff and then limp, the tongue was sometimes retracted back in the mouth so as to occlude the passage of air through the larynx, the pulse was weak and uneven, and death soon followed.

To overcome this collapse quick action was necessary. As carbon tetrachloride and its fumes are of heavy molecular weight, the fox was suspended by its hind legs for a few seconds to allow the drug to gravitate from the lungs. Simultaneously, the thorax was compressed a few times to help force out the drug. The animal was laid on its back and artificial respiration accomplished by a method frequently used upon human beings, that is, by the method of working the fore limbs back and forth and pumping the chest. Precaution was taken that the tongue was not retracted back in the mouth so as to prevent inspiration.

In the fourteen cases of inhalation-collapse encountered, nine recovered and five died. In some instances the animal could not be revived because of the sudden and complete cessation of respiration. Most of the animals which could not be revived by artificial respiration were in impaired physical condition.

RELATIVE FREQUENCY OF INHALATION-COLLAPSE IN THE USE OF
HARD GELATIN CAPSULES AND SOFT ELASTIC GLOBULES

The use of hard gelatin capsules was found to be attended with dangers and losses due to the inhalation of the drug. These capsules, being brittle, were easily crushed by the teeth and were rapidly dissolved by the juices of the mouth, thus allowing the drug to escape with toxic and sometimes fatal results. Of the 110 foxes which were given a total of 220 single capsules, 10 (9.1 per cent) suffered inhalation-collapse and 4 (3.6 per cent) died from this form of intoxication. Although all of these capsules were dipped in castor oil, just previous to administration, so as to lessen their solubility and hasten the swallowing, most

of the cases of inhalation-collapse occurred as a result of capsules dissolving in the mouth.

In an attempt to overcome these dangers double capsules were tried, these being prepared by inclosing a 1-cc hard gelatin capsule containing the drug within one of the $1\frac{1}{2}$ -cc size. These capsules were also dipped in castor oil just before administration, and 62 of them were given to 31 foxes. Four (12.9 per cent) of the 31 animals suffered inhalation-collapse and one (3.2 per cent) died as a result.

The idea was finally conceived of having the drug made up in soft elastic globules, containing doses varying from $\frac{1}{4}$ to 2 cc, for various-sized foxes. These globules, being tough and elastic, will withstand considerable biting, and they are also slowly soluble in saliva. One of us held a globule in the mouth for 25 minutes without its dissolving sufficiently to liberate the drug. Besides, tests were performed upon foxes shortly after death to determine whether the different sizes of globules containing effective doses of the drug could be forced down the trachea of the animals of the sizes for which they should be used. These tests indicated that the size, shape, and elasticity of these globules should preclude their passage into the trachea.

A total of 663 globules was given to 515 foxes. None of these animals suffered inhalation-collapse. One experiment animal, however, which was given eight globules at one dosing, died from suffocation when one globule became lodged over the laryngeal opening.

These results demonstrated the safety of the globules over hard gelatin capsules. With proper precautions in administration, the use of the globules should reduce inhalation-collapse to a minimum. Another advantage found in having the drug made up in globules was that the task was eliminated of measuring individual doses before the treatment of each fox or small groups of foxes, a factor of practical importance when several animals are treated at one time.

RETARDED SOLUBILITY OF SOFT ELASTIC GLOBULES AND THE NECESSITY OF AN EXTENDED FAST FOLLOWING THEIR ADMINISTRATION

To determine the time required for soft elastic globules to liberate their contents after reaching the stomach, and also to determine whether it is necessary to withhold feed and water longer after the administration of carbon tetrachloride in soft

elastic globules than after its administration in hard gelatin capsules, foxes were given the drug either in hard gelatin capsules or soft elastic globules, killed with an intrathoracic injection of strychnin sulphate at varying periods from $\frac{1}{2}$ to $1\frac{1}{2}$ hours after dosing, and promptly opened. Observations made in these tests are reported in the following table:

Time killed after dosing	Type of capsule used	Number of animals	Number of capsules		Location of dose and remarks
			Intact	Broken with contents released	
$\frac{1}{2}$ hr.	Hard	1	0	6	Entire dose still in stomach.
$\frac{1}{2}$ hr.	Soft	1	4	0	Entire dose still in stomach.
$\frac{3}{4}$ hr.	Soft	1	4	0	Entire dose still in stomach.
1 hr.	Hard	1	0	6	Some of drug still in stomach, but most in anterior half of small intestine.
1 hr.	Soft	2	5	3	Entire dose still in stomach.
$1\frac{1}{4}$ hr.	Soft	2	3	5	Entire dose still in stomach.
$1\frac{1}{2}$ hr.	Hard	1	0	6	Entire dose in small intestine, chiefly in the posterior half.
$1\frac{1}{2}$ hr.	Soft	1	0	4	Practically all of the drug still in the stomach; small amount had passed into the duodenum. Animal was fed 3 minutes before killing, and the feed and drug were found mixed in pyloric region of stomach.

It was found that it requires from 1 to $1\frac{1}{2}$ hours for soft elastic globules to liberate their contents after reaching the stomach; also that globules containing a therapeutic dose (0.3 cc per kilo) of carbon tetrachloride dissolve and liberate the drug in the stomach before they pass into the small intestines. Carbon tetrachloride, given in hard gelatin capsules, passes about an hour sooner into the small intestine than when given in soft elastic globules. Thus, in order to obtain as effective anthelmintic results in the use of soft elastic globules for the administration of carbon tetrachloride as in the use of hard gelatin capsules, food and water apparently should be withheld about an hour longer after treatment than is necessary after use of the hard gelatin capsule.

EFFICACY OF CARBON TETRACHLORIDE IN GLOBULES

Provided that food and water are withheld long enough after dosing, the drug apparently is as effective in globules as in hard gelatin capsules. Three foxes, given the drug in globules at the

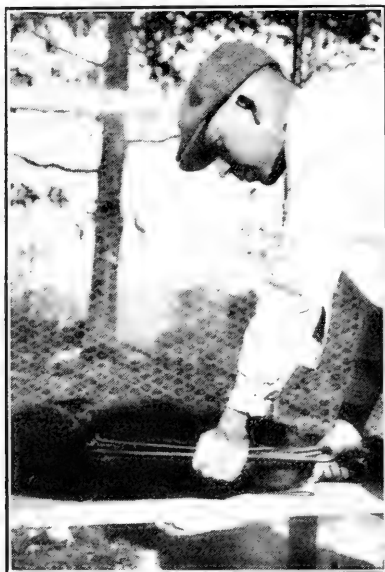


Fig. 1. The first step in restraint is to grasp the fox around the neck with the tongs in the left hand and the hind legs in the right. Grasp the fore legs in the left hand holding the tongs and lay the animal on its side.

MANY FOXES TOLERANT TO LARGE DOSES OF CARBON TETRACHLORIDE

Many foxes tolerate large doses of chemically pure carbon tetrachloride. Eleven different foxes were given doses varying from 6 to 12 cc without showing apparent toxic effects. Approximately twenty foxes were treated with therapeutic doses, at two-week intervals, for a total of four treatments for each animal. None of these animals showed apparent toxic effects, with the exception of one which died from a

rate of 0.25 cc per kilo, passed 56 hookworms and retained 5, an efficiency of 91.8 per cent; passed 38 ascarids and retained 3, an efficiency of 92.7 per cent; passed 8 intestinal flukes and retained none, an efficiency of 100 per cent. The method of determining the efficiency of these treatments was the same as that used by Hall.¹ These results, obtained with a dose rate of 0.25 cc per kilo, compare favorably with the results obtained by Allen² when he gave the drug in capsules at the rate of 0.3 cc per kilo.



Fig. 2. The operator takes a secure hold of the two ears with the left hand as close as possible to the head.

delayed intoxication described later. Fifty-five cc were given by means of a stomach tube to an 8-pound red fox following a 20-hour fast. This was a dose rate of over 15 cc per kilo. This dose was followed in two weeks by 6 cc and in a month by 2 cc. Although all three of these doses, especially the first, were larger than necessary to obtain effective anthelmintic results, the animal showed no apparent toxic symptoms.

DELAYED INTOXICATION FROM CARBON TETRACHLORIDE

In spite of the fact that previous tests indicate carbon tetrachloride to be apparently non-toxic in various doses by way of



Fig. 3. The tongs are released by the assistant, who continues holding the legs while the operator holds the ears.

the digestive tract, losses occurred from what may be called a delayed intoxication. Of 660 foxes treated, 27 (4.09 per cent) have died from 12 hours to 4 days after treatment. The doses varied from 0.3 to 0.54 cc per kilo. The dose rate in the majority of these fatalities varied slightly from 0.4 cc per kilo.

The most common and typical lesion encountered was finding a large amount of unclotted blood in the abdominal cavity. This blood was dark, but turned a bright red upon exposure to air. It failed to clot after standing twenty-four hours. The source of this blood was probably from the liver or the hem-

orrhages in the various tissues in the abdominal cavity, as described below, or both.

Other lesions found were hemorrhages, usually suggillations, of the endocardium of the left ventricle, mesentery, diaphragm, pancreas, and occasionally in the muscle tissue and the connective tissue under the skin. These hemorrhages usually were dark in color. As a rule, the kidneys were congested. The liver bulged on section, the tissues were friable, and the lobules were easily visible, being dark at the center and light at the periphery. Many cases showed a generalized icterus. The mucosa



Fig. 4. The operator tilts the head by pulling back on the ears. In his right hand he takes the forceps, grasps the globule with them, and passes it into the throat.

of the small intestines, especially of those foxes which lingered more than two days after dosing, showed extreme congestion, with areas of hemorrhage. The intestinal contents were dark and of a tarry consistency. The lesions were more or less typical in every case of delayed intoxication.

Most of these losses occurred in the treatment of 52 adult foxes on one ranch. Nineteen of these (36.5 per cent), each of which received a 2-cc globule, died from two to four days after dosing. Although this loss was suffered in the treatment of the adult

foxes, none were suffered when each of 66 seven-months-old pups on the same ranch were given a $1\frac{1}{2}$ -cc globule. These globules were submitted to a chemical examination by the Bureau of Animal Industry of the U. S. Department of Agriculture. The carbon tetrachloride was found to be chemically pure and the gelatin free of toxic chemicals. From the carcasses of several of these foxes a strain of *Bacillus coli*, which fails to ferment saccharose, was isolated in the bacteriological laboratory of the Pathological Division of the Bureau of Animal Industry, U. S. Department of Agriculture. Excluding the use

of the drug on the above group of 52 animals, the losses from delayed intoxication were 8 (1.31 per cent) of 608 foxes treated. Of these eight which died, one was subject to infectious enteritis and four were seriously affected with notoedric mange.

Others apparently have encountered losses from this form of intoxication. Doctor F. N. Steele, of Muskegon, Mich., has brought to our attention an instance of several foxes dying from one to five days after treatment with carbon tetrachloride. These foxes were found to have an infectious disease characterized by an acute enteritis.

Thus it should be emphasized that sometimes there is danger of losses from treating foxes with carbon tetrachloride, even



Fig. 5. The fox snaps its jaws together when the dorsal arch of the tongue is reached, the instrument is pushed back, and the globule released in the pharynx.

though the full dose of the drug reaches the stomach intact. The danger seems to be increased when disease is present.

MODES OF RESTRAINT AND THE ADMINISTRATION OF GLOBULES AND CAPSULES

Of the several methods of administering globules and capsules to foxes thus far tried, the most satisfactory has been the use of Bozeman double-curved forceps for the globules and a metal balling gun for both the capsules and the globules. The mode of restraint and administration was similar for each in-

strument, and it was seldom found necessary to use a mouth-gag.

In the method employed, the fox was laid on its side and held by an assistant grasping the legs and tongs (Fig. 1). After the operator obtained a secure hold of the head by clasping the ears in one hand (Fig. 2), the tongs were removed (Fig. 3). The operator then tilted back the head of the animal by means of the hand holding the ears (Fig. 4), and with the other hand passed the instrument into the mouth and released the globule or capsule in the pharynx (Fig. 5). The globules or capsules were dipped in cod-



Fig. 6. The operator holds the ears long enough for the assistant to withdraw his hands from danger of being bitten.



Fig. 7. When two assistants are available, the first grasps the ears with the right hand, as shown in figure 2, and then places the left under the lower jaw; the second assistant holds the fore legs in one hand and the hind legs in the other.

liver or castor oil, just previous to administration, to make swallowing easy. When the operator tilted back the head, the fox usually opened its mouth wide and kept it wide open until the globule was given; however, in case the animal refused so to open its mouth, rubbing or tapping the under side of the throat usually brought the desired result. If the fox still refused to open its mouth, a mouth-gag was used.

Precaution was taken that the fox did not see or feel that the instrument was being placed into its mouth

until the dorsal arch of the tongue was reached, so as to lessen the likelihood of its biting down too soon on the instrument or globule. As soon as the instrument touched the dorsal arch of the tongue, which could not be avoided, the fox usually snapped its jaws together (Fig. 5). At this point the globule was seldom bitten and the instrument could be pushed back so as to release the globule in the pharynx. In case the globule was bitten, the rear end of the fox was immediately elevated and the head lowered to prevent inhalation or gravitation of carbon tetrachloride or its fumes into the lungs.

As soon as the globule was properly placed in the back part of the mouth, the instrument was withdrawn and the fox immediately released to insure quick and successful swallowing, the operator holding the ears just long enough to allow the assistant to let go of the legs and withdraw his hands from danger of being bitten (Fig. 6). After the fox was liberated, it was carefully watched to determine whether it had swallowed the dose, usually indicated by protrusion and retraction of the tongue, and also to determine whether it was suffering inhalation-collapse.

When two assistants, instead of one, were available, the method of restraint was sometimes modified by having one assistant hold the ears and manipulate the head while the other one held the legs. In holding the head, the assistant first grasped the ears with one hand and placed the other under the lower jaw; thus the head could be held in the desired position and steadied (Fig. 7). Care was taken that the hand under the jaw did not interfere with breathing or swallowing. This dispensed with the necessity of the operator holding the head, thus relieving him of considerable work and increasing the safety of administration.

SUMMARY

The larger proportion of foxes which suddenly inhaled carbon tetrachloride or its fumes, usually as a result of capsules dissolving or breaking in the mouth, collapsed within a few seconds after the drug was administered. This inhalation-collapse was characterized principally by cessation of respiration. Artificial respiration, provided it was promptly applied, frequently was successful in reviving animals suffering this collapse. Of the fourteen foxes which manifested inhalation-collapse, five could not be revived.

Tests demonstrated that inhalation-collapse was not so likely

to occur when carbon tetrachloride was given in soft elastic globules as when given in hard gelatin capsules. Of the 141 foxes which were given the drug in hard gelatin capsules, 14 (9.9 per cent) suffered inhalation-collapse and 5 (3.5 per cent) died. On the other hand, none of the 515 foxes which were given the drug in soft elastic globules suffered inhalation-collapse. There were also other practical advantages found in giving the drug made up in soft elastic globules.

The retarded solubility of globules did not allow the drug to escape and become available for anthelmintic action until 1 to 1½ hours after dosing. Globules containing a therapeutic dose (0.3 cc per kilo) liberated their contents in the stomach before passing into the small intestine. Feed given 1½ hours after the administration of globules was found mixed with carbon tetrachloride in the pyloric region of the stomach. The drug was found to leave the stomach about an hour sooner when given in hard gelatin capsules than when given in globules. This indicates that, in order to obtain as efficient anthelmintic results in the use of soft elastic globules as in the use of hard gelatin capsules, feed and water should be withheld an hour longer after the administration of the drug in globules than is necessary after its administration in hard gelatin capsules.

Carbon tetrachloride apparently was as effective in the removal of worms when given in soft elastic globules as when given in hard gelatin capsules, that is, provided food and water were withheld for three hours after the administration of the globules.

Many foxes tolerated repeated and heavy doses of carbon tetrachloride.

Of 660 foxes treated with carbon tetrachloride, 27 (4.09 per cent) died from a delayed intoxication from two to four days after treatment. Danger of losses from this intoxication seems to be increased when disease is present.

The mode of restraint and method of administration described and illustrated was found to be the most satisfactory thus far tested for the administration of capsules and globules to foxes.

ACKNOWLEDGMENTS

Thanks are due the fox ranchers who kindly allowed the writers to perform many of these tests upon their foxes.

REFERENCES

- ¹Hall, Maurice C. Carbon tetrachloride for the removal of parasitic worms, especially hookworms. *Journ. Agr. Research*, April, 1921.
²Allen, J. A. The efficiency of carbon tetrachloride against hookworms in the silver black fox. *Journ. Amer. Vet. Med. Assoc.*, April, 1922.

CHRONIC CARRIERS IN FOWL TYPHOID

By B. F. KAUPP and R. S. DEARSTYNE, *Raleigh, N. C.*

Laboratory of Poultry Pathology of the North Carolina Experiment Station

HISTORICAL

The matter of disease carriers has been a subject of considerable concern to the poultry industry. The extent of liability of such birds in poultry mortality is problematical. Considering the fact, however, that birds dwell together in such intimate contact, drinking from the same containers, feeding from the same hoppers, utilizing the same range houses, etc., it is highly probable that the bird, sick of a contagious disease but not showing clinical symptoms, is a potent factor in disseminating such disease. It has been proved time and again in the field that a certain percentage of well birds in contact, as mentioned above, with infected ones, soon develop like disease. This occurs in roup, cholera, typhoid and many other diseases of the domestic fowl. The role that the actual carrier of such disease plays is yet to be conclusively proved.

A fact that mitigates largely against the elimination of carriers is the droopy, depressed appearance that is so common to many of the poultry diseases. Unless the poultryman is a keen diagnostician the chance of confusing the diarrheal condition common to slight intestinal upsets with the typical exudate of fowl typhoid is great.

In reference to the dissemination of fowl typhoid, C. Truche¹ says:

"Only adult fowls are attacked and natural contagion is probably by ingestion of food material soiled with infected feces. Experimentally, the disease is certainly transmissible that way."

F. d'Herelle² makes mention of the following relation to the transmission of this disease:

"The pathogenic bacillus remains alive and virulent during several months in the regions where the infection has been epidemic. In several tests, it has been shown that an isolated, infected chicken-yard, cleaned and left unoccupied for six to eight months, still contains virulent germs, for, when repopu-

¹Truche, C., *Jour. Comp. Path. & Ther.*, Edinburgh, Vol. 36, part 2, page 135, June, 1923.

²d'Herelle, F., *The Bacteriophage*, Pasteur Institute, Paris, France, p. 206.

lated with chickens from a region free from the disease, the infection breaks out again within a few days among the new occupants."

Hence the carrier problem in fowl typhoid, if the carrier is disseminating the bacilli in virulent form in the fecal matter and thus infecting the soil, is a serious one.

A FOWL TYPHOID CARRIER

In the studies being conducted on the septicemic diseases of the domestic fowl, by the North Carolina Experiment Station, an instance of a bird which might have been a possible carrier of fowl typhoid was noted during some artificial infection work on this subject. This bird was infected on the 15th of February with the fowl typhoid organism obtained from Lister Institute, London, England. With the exception of diarrhea, no clinical symptoms were noted, and the bird was discharged from the hospital on the 26th. Ordinarily this bird would not have been separated from the flock of a commercial poultryman at this



Fig. 1. A Mottled Ancona Hen Affected with Fowl Typhoid.

time. On the 3rd of March, the bird showed a relapse with severe clinical symptoms. The temperature was 111° F. This high temperature continued. On the 15th of March the bird refused food and this condition existed until the 21st when the bird was destroyed in the gas chamber for autopsy, the bird showing signs of emaciation at this time. *B. sanguinarium* was

isolated in pure culture from the kidneys although it was not recovered from the other organs. Post-mortem examination did not show the usual conditions existing in an acute case of fowl typhoid, but an emaciated condition of the internal organs due undoubtedly to a prolonged toxemia.

The hospital record and clinical picture of this bird is as follows:

Subject: Mottled Single Comb Ancona hen.

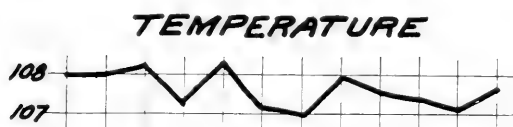
Source: Poultry Plant, Raleigh, N. C.

Condition on Date of Infection: Excellent.

Method of Infection: 5 cc bacillary saline emulsion of *B. sanguinarium* grown on 24-hour agar slant (Lister Institute, England) was placed in the drinking water at 4 p. m., Feb. 15, 1923.

Date	Temperature	Respiration	Remarks
Feb. 14	108.0	34	Pre-inoculation
15	108.0	36	Inoculated
16	108.2	30	
17	107.2	30	
19	108.3	36	
20	107.2	36	Diarrhea
21	107.0	38	Diarrhea. Excreta streaked with blood.
22	107.9	36	Test for septicemia—negative.
23	107.6	30	
24	107.4	32	
25	107.2	36	
26	107.6	36	

BIRD NO. 4
1ST SECTION OF HOSPITAL RECORD

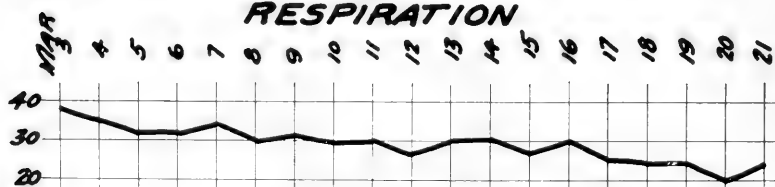


(Notation: To all physical appearances the bird was normal and had thrown off the disease. Bird was discharged. On March 3 clinical symptoms reappeared and hospital chart was continued.)

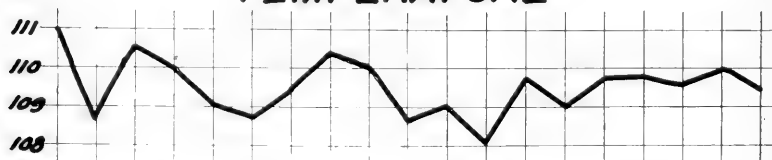
Mar. 3	111.0	38	Bird dejected
4	108.6	36	Discharge of about 25 cc watery matter.
5	110.6	32	Discharge watery.
6	110.0	32	"
7	109.0	34	"
8	108.8	30	"
9	109.4	31	"
10	110.4	30	"
11	110.0	30	"
12	108.6	27	"
13	109.0	30	"
14	108.0	30	"
15	109.8	27	"
16	108.0	30	"
17	108.8	25	"
18	108.8	24	"
19	108.6	24	"
20	109.0	20	"
21	108.4	24	Bird destroyed in gas chamber.

2ND SECTION OF HOSPITAL RECORD

RESPIRATION



TEMPERATURE



In regard to the possibility of spread of infection through drinking water and soiled feed from the ground, the following

studies in longevity of the organism under various conditions were pursued.

EXPERIMENTS ON RETAINED VIRULENCE OF *B. SANGUINARIUM*

Inoculated tap water subjected to sunlight showed no growth after 24 hours. The same was true of distilled water. The temperature of this experiment averaged about 80° F.

In the dark the organism retained its vitality for 20 days in both tap and in distilled water, after which time an excessive production of moulds precluded the chance of accurate work. The temperature in the dark averaged 70° to 75° F.

The ability to withstand dessication was worked out by inserting sterile glass rods into 24-hour bacillary saline emulsions of *B. sanguinarium* and inserting them in sterile, glass test-tubes. The following were the results in these experiments:

Growth was obtained from rods subjected to sunlight up to 30 hours.

Rods held under conditions of darkness showed growth up to 89 hours.

By subjecting immersed rods, as mentioned above, in dry heat (hot air oven) it was found that *B. sanguinarium* gives a good growth when subjected to 75° C. for five minutes but failed to grow if subjected to the same temperature for ten minutes. Luxuriant growth was obtained after subjection to 70° C. for 10 minutes.

SUMMARY

There is here shown a case of apparent recovery of a mottled Ancona hen suffering from fowl typhoid. Such a hen would likely pass unobserved in a commercial flock. Later the same bird developed well marked symptoms of the disease. Between the two attacks such a bird might easily be sold or otherwise disposed of and form a new center of infection.

MORE HORSES AND MULES SOLD

Reports from the sixty-seven principal live stock markets of the country just made public by the United States Department of Agriculture show that there has been a third more horses and mules sold during the first eight months of this year than were sold in the same period last year. The figures, to be exact, are: total sales, 319,392, an increase of 80,341 head, or 33.6 per cent. Furthermore, sales last year increased 16.3 per cent for this period over 1921.

BUSINESS PRINCIPLES AS APPLIED TO VETERINARY PRACTICE¹

By A. L. DANFORTH, *Watertown, N. Y.*

In the January number of the *North American Veterinarian* there was an article by Dr. E. V. Moore, of Cortland, on "Business Methods in Country Practice." This was so interesting, to me at least, that I was prompted to choose a similar subject, which may develop into more or less of a discussion of Dr. Moore's article. It has occurred to me for a long time that we practitioners pay too much attention to income and not enough to expense. There has always been too narrow a gap between gross receipts and expenses. The only way to widen this margin, which represents net profit, is to increase gross receipts or decrease expenses.

Gross income may be increased only by increasing the amount of business or by raising prices for services rendered. Increased volume will, of course, increase our net income, but the ratio between income and expenses remains the same unless we cut down expense.

In his paper Dr. Moore states that forty-five per cent of their gross receipts was consumed by expenses incurred in carrying on their practice. I appreciate the fact that one's office arrangement would have an important bearing on expenditures. We are fortunate in having dwelling and office at the same address, which simplifies receiving and handling calls coming in out of business hours, and avoids the expense of an extra attendant. It has not been our custom to itemize our expenses, in different departments, but we do divide them under two heads, putting our auto expense under one head and bunching everything else. In 1920 and 1921, when our practice was conducted as a partnership, as is that of Drs. Moore and McAuliffe, our expense averaged one-third of our gross receipts. During 1922 our expense consumed forty-two per cent of our gross income. This year, however, our practice was conducted with an assistant, and this forty-two per cent includes his salary.

We tried several years ago buying horses in fall and selling in spring, but with us this proved expensive, as light horses gradually declined in price, and we found that we had to hold

¹Read before the fourteenth annual meeting of the Central New York Veterinary Medical Association, held at Syracuse, N. Y., June 14, 1923.

them sometimes for weeks before selling. We find any number of farmers who are glad to let horses for a few weeks for their keep, and while we occasionally draw a lemon, we usually get a couple spoken for in the fall, get them when heavy snow comes and take them home as soon as we finish with them. This is much more satisfactory. For instance, this last winter we kept one horse and drove him only a little. The locality, of course, makes a difference, as we seldom get much snow around Watertown.

Our big item of expense is autos. We use Fords, and while I cannot compare their expense with that of other makes, I do know that they make up a little over one-half the total expense. I have found that the most economical way is to change every year. I think most of you would be surprised if you kept an auto expense account. Perhaps a more substantial make of car, used for a longer period, would be as economical, but never having graduated from the beginner's class, I am not qualified to say.

It has always been our practice to buy our supplies in fairly large quantities, but this has been limited somewhat by lack of storage space. I think that staple products such as cotton, bandages, etc., can be bought in quantities at a big saving, now that the market is somewhat stabilized, and with increased storage and hospital facilities, we shall buy in larger quantities. Our variety of drugs has decreased noticeably the past few years, and with just as good results. We buy acetic fluidextract of nux vomica, instead of the alcoholic, at about \$4.00 a gallon, and this is about the only fluidextract we do use. We spend very little money for biologics, except tetanus antitoxin in 500-unit doses and canine distemper serum and bacterins, the value of the latter being somewhat in question.

I think our prices compare favorably with those of other practitioners. We charge \$2.00 for city calls, with medicine extra, i. e., if any great amount is left. The local physicians charge \$3.00. Charge for spaying is \$5.00 for puppies and extra for old dogs, with an additional charge of fifty cents a day while in the hospital. We have a flat rate of \$5.00 for cats. Castration of colts, yearlings, \$5.00; \$7.00 for 2-year olds and \$10.00 for older ones. I do not think we get quite so much for obstetrical work as some others. Our minimum charge is \$5.00, and we rarely get over \$10.00 or \$12.00, unless quite some distance away. For country calls we charge fifty cents a mile one way and \$2.00 for the call; extra charge, of course, for night work.

Office calls, \$1.50 for horses and \$1.00 for small animals, unless some special service is rendered.

In our section fifty per cent of our clients are tenant farmers and we do not have many of the higher type of dairy cattle and for this reason our prices are, of course, limited to a certain extent.

Collections have been a problem during the past two years, but conditions are better now. The question of how lenient to be must be decided in each individual case. We have very few for whom we refuse to do work, but we have quite a large number of clients who are slow pay and who must be dealt with rather firmly. Unless we know positively that a client is a "dead beat," we make the call and then if pay is not forthcoming, we find out the reason why. I might add that all small animal work is cash in our place. We have also always made it a practice, in cases that terminated badly, to make quite a substantial reduction in the bill.

Another rule I have always tried to follow is to place myself in the client's position, and I believe if we could do this, we could more readily understand his losses when a valuable animal dies, especially if the client is one who cannot well afford the loss.

Promptness is to my mind as much of an asset in practice as it is in any line of business. When an owner finally makes up his mind to employ a veterinarian, the sooner he can get the service the better he is pleased. I know of two veterinarians in particular who are complaining of hard times and, only a few days ago, a foreman of a stable with several horses told me it usually took about three days to get one of these veterinarians to make a call on one of his animals. Whether it is a case of colic, dystocia, or foot-rot, it should be attended to as promptly as possible.

The question of dispensing is receiving more or less discussion in our journals. For my part, I do not see how a country practice, that is widely scattered, can be capably handled without dispensing. The system should be used with judgment, however; otherwise we are apt to take on the appearance of drug-store clerks. Dispensing such preparations as dusting powders, liniments, heave medicine, etc., is especially necessary, when two are handling a widely scattered clientele.

The matter of receiving telephone calls is especially important. No practitioner's telephone should be left alone at any time, whether he is available or not. Regardless of the fact that I

may be away for a week, I insist on my telephone being answered by someone. It must be annoying to a client to try for several times and not be able to get a raise. Other conditions being equal, he is apt to call the next time where he is sure of getting an answer.

There has always been a question in my mind whether we practitioners should not do more advertising. If we have a service which we can render to stock owners, I do not see any legitimate or ethical reason why the owner should not be apprised of the fact. Personally, I have never done any myself, but I believe that this could be done in a dignified and strictly ethical way. Conditions have changed materially in the past ten or twelve years and are still changing, and if we are to survive we must adapt ourselves to these changes.

As for the future of veterinary medicine, I really think we have passed through our worst crisis during the past two years. I do not anticipate any great boom in heavy horse business, but I do think more heavy horses will be used in cities the next few years for short-haul work. Farmers, also, are going to continue to use horses, at least until cost of operating trucks and tractors is materially reduced. We should keep ourselves posted on the horse industry, and let no opportunity pass to boost and encourage the raising and using of good horses. The dairy industry has probably passed through its worst crisis. Consumption of dairy products has increased appreciably during the last two or three years and will continue to increase. This will, of course, mean increased attention to dairy cattle. We should help to educate the farmer regarding the value of keeping cows of good production instead of so many scrubs.

The veterinary profession is not going to boom to the point where we can lie down on the job, but, on the other hand, I do not think there is any grave danger with which to concern ourselves, provided each of us continues to apply himself with diligence, maintaining perseverance, courtesy and high ethical standards.

Small details are not obstacles to be walked around, but steps to be used in getting up. Small tasks can be the best training for subsequent responsibilities. Study the life of a man who has become an outstanding success and you will find that he began by doing the little things well—and never broke the habit.

PYOMETRA IN THE BITCH¹

By R. H. SPAULDING, *White Plains, N. Y.*

Pyometra is of quite common occurrence in bitches. It is found fully as frequently in females which have never been bred, or, one might more correctly say, in those where a known mating has never taken place, as in those which have had puppies. It occurs as a sequela of endometritis and occasionally of septic metritis. It is sometimes seen as an aftermath of douching to prevent pregnancy from an undesirable mating. In old bitches, it frequently follows a prolonged and profuse season. The condition is not so frequent in young as in old bitches. With relation to the period of season it may occur at any period, but is more often seen from 6 weeks to 2 months after completion of heat.

The pus accumulates slowly, especially in the early stages, and attains an enormous quantity. I should say that it would take from four to six weeks for sufficient pus to accumulate to cause discomfort to the animal. In one case, a Pekinese, which was operated on, the uterus and pus weighed seven pounds, while the dog weighed fourteen pounds, five or six days after the operation. There were easily two quarts of pus in the uterus.

SYMPTOMS

The first symptom of pyometra is a gradual enlargement of the abdomen. Occurring as it usually does, following heat, it is easily mistaken for pregnancy. In some cases when the uterus becomes sufficiently filled, the pressure causes a dilatation of the os uteri and discharging takes place. As soon as the pressure is reduced the os closes, preventing further discharge for a time. Later, when the pressure is increased, the os again opens. In other cases no discharging takes place and acute symptoms are observed. The animal has a high fever, loss of appetite, costiveness and great depression.

Unless relief is given in these cases the bitch will soon succumb to septicemia. In all cases, as the distention of the uterus increases, the appetite decreases, the animal finds it more difficult to move and she becomes inactive, listless and drowsy. Quite frequently, when the disease lasts for some time, a digestive disturbance develops, as evidenced by chronic meteorism. This I have found particularly true in those cases associated with menorrhagia.

¹Read before the Veterinary Medical Association of New York City, June 6, 1923.

The pus is usually yellow or greyish-yellow in color, but may be reddish-brown. In consistency it is very thick and stringy. The quarters, when soiled with the pus, rapidly become sore and blistered. Urination is frequent and the quantity small. This is due partly to the increased pressure in the abdominal cavity and partly to the irritation of the genitals.

The bowels are usually costive, but with the advent of septicemia diarrhea develops. In old dogs the heart is often affected and with the occurrence of a profuse discharge needs to be bolstered, to counteract the shock. Discharge from the eyes and a cough are occasional symptoms, but not so diagnostic as in septic metritis.

DIAGNOSIS

As has been said before, pyometra is often diagnosed as pregnancy, in spite of the fact that, in the literature, stress is laid on this point. It may also be confused with dropsy, but in my experience dropsy is not nearly so frequent in the female as in the male. I can not now remember of ever having seen a pronounced case of dropsy in a bitch. Percussion of the abdomen in pyometra gives a dull and heavy sound, in contrast to the hollow tympanic sound of dropsy. On palpation, one can usually distinguish the two horns of the uterus. The enlargement in pyometra is much heavier than dropsy. There is very often more or less ascitic fluid present with pyometra.

TREATMENT

The most logical mode of treatment is, of course, the surgical removal of the uterus, since this forever removes the possibility of recurrence. This, however, is not always feasible. Owners of breeding bitches often hesitate, even though the life of the bitch is at stake. In old dogs an operation is not always practical. In acute cases, with septicemic symptoms, the operation is attended with danger. Of late I have had a nest of these cases, where an operation was not possible, and consequently was forced to attempt treatment. The results so far have been very satisfying. This may be due as much to luck as to the scientific application of treatment.

I start the treatment with vaginal douches of large quantities of hot water. These are repeated every four hours until discharging takes place. In addition to this, gossypoid, which is an alkaloid of cottonroot bark, is given in doses of from $\frac{1}{8}$ to $\frac{1}{2}$ grain, three or four times a day. The action of this drug is to

stimulate the contractions of the uterus. In some cases Abbott's mixed infection bacterin (canine) is used. The discharge usually starts inside of 36 hours. When this is accomplished the douching is stopped. As soon as the uterus appears, on palpation, to be fairly empty, I inject dichloramine T in chlorcosane. From one to four ounces of a 0.5% solution is injected as far into the uterus as possible. If the posterior quarters of the dog are raised, the oil will flow well forward into each horn. These injections are repeated every second day as long as it is possible to pass a small catheter through the os uteri.

Should the uterus close and more pus accumulate, the douches would be repeated. Never have I had to do this more than once. When I feel that the uterus is not going to refill, I stop the gossypoid. In these cases where the bacterin was used, there was no appreciable difference in the course or outcome of the condition.

CASE REPORTS

The first case I attempted to treat in this manner was an Irish terrier, 9 years old. Following her season a year ago last fall, she had a terrible hemorrhage which nearly killed her. I saw her a few months after this and she was suffering from repeated attacks of indigestion, with a great deal of gas. Nothing I can give her will give her permanent relief from this symptom. I have tried to get the owner to consent to a hysterotomy, but have not succeeded. Her spring season last year was uneventful, but last fall, shortly after she went out of season, pus began to form and by the time the owner noticed it a great deal was present. After the third douche, using six quarts of very hot saline solution, she began to discharge so profusely that I had to bolster the heart to prevent collapse. The discharge stopped on the fourth day and another smaller douche was used, which started the pus, and this time she cleaned out entirely. She had four injections of chlorcosane and three doses of bacterins. Up to six weeks ago there was no recurrence.

A fox terrier, of 14 years, had a very profuse season which terribly weakened her. About a week later I observed the distention of the uterus. One douche started the pus but after discharging for 24 hours it abruptly stopped, necessitating a second douche. She was given five doses of oil, but no bacterins. Both of these dogs are about to come in season and I am anxious to see what sort of a time they will have.

I attended a Pekinese, 4 years old, a year ago last Christmas, for dystokia, with one dead and three live puppies. She had metritis following this and I douched her four times with a weak Lugol's solution and apparently she cleaned up. Her summer season and that of last winter were apparently normal so far as the owner, a breeder of some experience, could tell. About three months from her last season she was brought to me with a badly distended uterus. I gave her bacterins and gossypoid, with instructions to douche. The woman lived alone and had poor success douching, so that when she came back in five days there were no results. She had to make a trip of thirty miles, so that I could not douche for her. I repeated the bacterin and increased the dose of gossypoid, with no results. After the fourth dose of bacterin, the woman was able to give a good douche and the discharge started. I saw the dog three times after that, at varying intervals, at which times I gave bacterins and oil. In all, she had seven doses of bacterin, three injections of chlorcosane, and gossypoid $\frac{1}{3}$ grain, three times a day, for a period of four to five weeks. So far she has no recurrence, but of course only a month has elapsed since the treatment was finished.

I truly believe that the gossypoid aids in producing the discharge of pus. Chlorcosane and dicloramine T have proven to be a wonderful antiseptic application for external wounds, and I think it will prove equally efficient in the uterus. I am using it in all of my cases of metritis.

NEARLY FIVE MILLION CATTLE UNDER SUPERVISION IN TUBERCULOSIS ERADICATION

A report just issued by the United States Department of Agriculture, summarizing the status of tuberculosis eradication work at the beginning of September, shows nearly 5,000,000 cattle under supervision for the eradication of the disease.

A total of 661,260 cattle, including both beef and dairy breeds, are in fully accredited herds. Nearly 3,000,000 cattle are in herds that have successfully passed the first test in process of becoming accredited. The remainder are in herds that are not yet free from tuberculosis and are under supervision of varying stages.

The popularity of the tuberculin test is indicated by a waiting list of more than 145,000 herds that will be tested as soon as Federal and State veterinary inspectors can get to them.

VETERINARY EXTENSION WORK IN KENTUCKY¹

By T. P. POLK, *Lexington, Ky.*

Field Agent in Veterinary Science, University of Kentucky

The duties of the Extension Veterinarian are varied and must of necessity cover a wide field. He aims to serve the community in that his attention is directed toward such conditions as would affect a number of animals, or even spread from one farm to another, rather than to individual cases that can readily be handled by a local practitioner. He is better enabled to do this through the aid of the county agents and local veterinarians. So far as possible, the work of the Extension Veterinarian is being carried out in the form of projects, which are outlined as follows:

1. Educational and demonstrational work on the importance of tuberculosis eradication.
2. Farm sanitation.
3. General field diagnosis of infectious, contagious and parasitic diseases and preventive medicine.
4. To discuss with farmers the manifestation of disease, the importance of early recognition of sickness and the care of sick animals.
5. The promotion of co-operation among veterinarians, county agents and live stock interests.

The tuberculosis projects consist of educational work carried on in cooperation with county agents, local practicing veterinarians, state and federal forces, stockmen and other allied interests engaged in tuberculosis eradication.

The project on farm sanitation is an important phase of the work, since the recurrence of disease and serious economic losses may result from a failure to combat the causative factors of the more serious infectious and parasitic diseases, such as hog cholera, Johne's disease of cattle (infectious bacterial enteritis), tuberculosis, glanders, blackleg, sheep scab, scabies of swine, and intestinal parasites. When the virus that produces a certain disease, and the parasites which carry it, are allowed to remain on the premises, in places not exposed to the sun, or without proper sanitation, they are often capable of causing subsequent outbreaks, a fact which is sometimes hard to impress upon the

¹Read before the annual meeting of the Kentucky Veterinary Medical Association, Lebanon, Ky., July, 25-26, 1923.

farmer and stockman, since the organisms are too small to be seen with the naked eye. If, on the other hand, they were large enough to be seen, the importance of their being destroyed would be self-evident, and so would immeasurably lessen the task of explaining the value of sanitation.

Much service has been rendered the stockmen and farmers by the Extension Veterinarian, through visits to the farm to detect disease and determine its nature. If a positive diagnosis can not be made from a study of the sick animals, it is advisable, when possible, to hold a post-mortem examination. The animal selected for such examination should be a typical specimen, in an advanced stage of the disease. It is often necessary to collect suitable material from a sick or dead animal, and forward it to the laboratory for confirmation of conclusions made from field observations, or to establish a correct diagnosis. As soon as a positive diagnosis is made, proper treatment and prevention may be outlined.

Field work in cooperation with the private practicing veterinarian is of great value to the Veterinary Department of the University, in its various research projects. In counties where there is a farm advisor or county agent, the work of the Extension Veterinarian is carried on with less difficulty and with a better understanding between all parties than in a county without an advisor.

Another opportunity given to the Extension Veterinarian by the county agent and local veterinarian is that of meeting the members of the different organizations of farmers in the community. Thus, he is enabled to present his projects to some he might otherwise never reach.

Much success is due directly to the educational policy which enables the live stock owner to understand his problems. Thus he is willing and anxious to cooperate with the Extension Service, the county agent, and the local practitioner. As stated in the introduction, it is not the purpose of the Extension Veterinarian to render service of a personal nature, but rather to give demonstrations and advice regarding the problems of those animal diseases that concern the live stock interests in a given community or in the state as a whole.

Considerable interest has been manifested by the local practitioner for the control of infectious abortion in cattle and swine. The yearly death-toll of this disease in cattle exceeds, in money value, the losses from any other disease affecting cattle. This

is especially true as concerns dairy cattle. The Extension Veterinarian is glad to cooperate with the local practitioner to the best of his ability to determine if disease exists in the herd by assisting him in the drawing of blood for laboratory diagnosis. Recommendations have been made for such sanitary measures as would seem necessary to control infection. Where infectious abortion exists in a herd and vaccination is indicated, it is usually determined by blood tests. Criticism of using live organisms is eliminated by vaccinating, with live cultures, only those herds where the disease is proven to exist.

Collection of blood from cattle is made by bleeding from the jugular vein. The point of introduction of the needle is first rendered sterile by tincture of iodine. A fresh needle is used on each animal, when possible, and the hands are thoroughly washed to remove any blood which might possibly contaminate the blood of a healthy animal.

The problem of abortion in swine is practically along the same line as that of cattle. Swine are bled from the tail. The procedure is as follows: First clip the hair from the tail with a pair of scissors. The tail is usually massaged with a cob to stimulate circulation, then thoroughly washed with soap and water and dried with a clean towel; then disinfected with alcohol and about one-half to an inch of the tail is severed, either with a sharp knife or pair of scissors and blood is collected in a sterile tube which is numbered on the stopper. Identification is made possible by having the name of the animal correspond with the number on the bottle. Subsequent bleeding can be controlled by tying off the end of the tail with a cord. The fresh wound is then disinfected with tincture of iodine.

Abortion infection seems to be a problem not only of today but also one of our outstanding financial questions of disease control of tomorrow, for this disease seems to be spreading at an alarming rate, which, in a large measure, is due to the unscrupulous methods practiced by some stockmen in disposing of infected animals which are introduced into clean herds. In other cases, disease is transmitted into healthy herds through the ignorance of the seller when disposing of diseased animals.

Recommendations have been made to owners who have clean herds to guard against the introduction of infection by conducting blood tests on new additions, thus safeguarding, in a measure, the introduction of abortion. Infected animals should be eliminated from the herd because they are capable of spreading

infection, even though they have established their own immunity and carry, to maturity, healthy, living offspring.

From a sanitary standpoint, diseases in herds are almost impossible to control, unless the spreaders are eliminated, as the abortion organism is believed to be transmitted through digestive tract by contaminated feeds.

UNUSUAL LESIONS

An unusual post-mortem report was recently received by the Bureau of Animal Industry, covering the slaughter of seventeen reacting cattle, one of which was reported as having no visible lesions. Of the remaining sixteen cattle, eight were reported as having preapular lesions, three of these eight being reported as preapular lesions only. In addition to that, one animal was reported as showing a precural lesion only, while one animal showed marked, acute, generalized tuberculosis. This was of such an unusual character as to lead to an investigation which indicated that one animal was probably the center of infection of the entire lot, as the cattle were known to have intermingled for some time. The unusual character of the lesions was not accounted for. However, this investigation indicated that this lot of cattle was a very good demonstration of the infectious character of the disease under ordinary circumstances and in the average community.

FOR PROSPECTIVE VETERINARY STUDENTS

The Division of Veterinary Medicine of the Michigan Agricultural College has prepared two very presentable pieces of literature for distribution among prospective veterinary students. One of these is a brochure of sixteen pages, profusely illustrated with views of various buildings and campus scenes at the East Lansing institution. The other is a less pretentious booklet, evidently intended for insertion in correspondence, bearing the title, "Veterinary Medicine and Its Opportunities." This is an excellent exposition of the attractiveness of veterinary medicine for a career.

The alarm clock causes more men to rise than ambition.

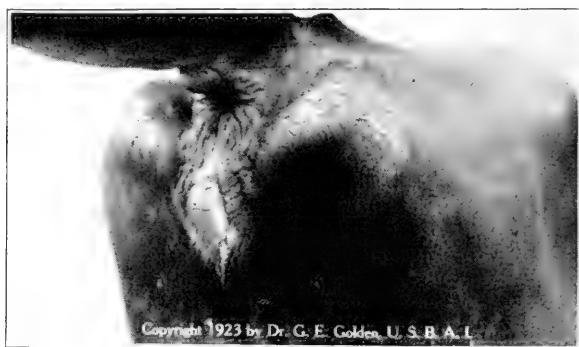
Everytime a man loses his temper another gains his point.

DOUBLE INTRADERMIC TUBERCULIN INJECTION

By G. E. GOLDEN, Sioux City, Ia.

Veterinary Inspector, Bureau of Animal Industry

In making observations on herds where the double injection was used, and from which ninety-five reactors were removed, the vulva injection was found a valuable adjunct in classifying the reactors. Slightly more than five per cent of the animals classified as reactors failed to give some degree of reaction to both tests. A number of animals gave but a very slight reaction to the caudal-fold injection and without the additional vulva reaction in these animals they possibly would have been classified as suspicious. Ninety-one of the ninety-five reactors were slaughtered and three failed to show visible lesions. The no-lesion animals gave well-marked reactions to both injections and were removed from herds where a large percentage of infection was found.



Fourteen-year-old cow showing a double reaction to an intradermic tuberculin test seventy-two hours following injection of the left caudal fold and left labia.]

The reactions to the vulva injection were all definite. The tissues surrounding the point of injection were firm and hard to the touch and could be readily distinguished from the soft tissues of the normal labia. In some reactions, where the swelling was intense, there was an inflammation of the surrounding mucous membrane. In other reactions where the swelling was more intense there was a proliferation of the mucous membrane, giving the surface a crusty, yellow appearance.

The vulva injection was made on the marginal line between the internal and external labia, about one inch above the inferior commissure. In hogs the injection is made on the line between the internal and external labia. The reaction to this injection in hogs consists of a swelling which is usually circumscribed and from the size of a pea to that of a cherry.

In contrast to the soft tissues of the normal labia the reaction is well defined, firm and hard to the touch. This site of injection in the hog appears to give better results than when the injection is made in the ear. Observations in hogs were made seventy-two hours following injection.

The almost constant reaction of tuberculous animals to both injections would make this extra injection appear almost unwarranted were it not for the confidence it instills in the operator to classify, as reactors, animals in which there is only a very slight reaction in the caudal fold. Two of the ninety-one reactors slaughtered and condemned as generalized cases would not have been classified as reactors to the caudal-fold reaction alone, as in each case it was very slight.

When the double intradermic injection is used, unusual care should be taken to insure that a proper injection has been made of both the caudal fold and vulva, in order that the usual reaction of these tissues in tuberculous animals will follow. The absence of a reaction to either injection would no doubt be confusing to the operator, who, on observation, found but one slight reaction.

In ninety-five animals classified as reactors to the intradermic test, where a double injection was made, the following reactions were found to each injection.

	Caudal Fold	Vulva
Negative.....	4	1
Slight.....	29	31
Well Marked.....	55	42
Extensive.....	7	21

Better little talent and much purpose than little purpose and much talent.

Hold yourself responsible for a higher standard than anybody else expects of you. Never excuse yourself. Never pity yourself. Be a hard master to yourself—and lenient to everybody else.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

AN UNUSUAL CASE OF RABIES

By B. M. LYON, *Pearl River, N. Y.*

*Assistant Director, Veterinary Department
Lederle Antitoxin Laboratories*

Having come in contact with and observed a large number of cases of rabies in the past few years in connection with diagnostic work upon this disease and also through a large amount of experimental work conducted at the Lederle Antitoxin Laboratories, I desire to describe here briefly a case which has been brought under my observation which has been of particular interest due to the extraordinary presentation of symptoms or course of the disease.



An Unusual Case of Rabies

This dog as shown in the accompanying photograph, a cross between an Irish terrier and French poodle, was brought to the laboratories August 16 for observation. The history obtained from the owner was quite typical. He described the dog as a very dear and friendly household pet, which never left the household without the knowledge of the owner and therefore the utter impossibility of his dog ever having been exposed to the disease. Nevertheless this same pet disappeared from the owner's threshold August 15, was gone all night and returned

about noon the following day. The owner noted a change in the dog's disposition upon his return and while endeavoring to account for the condition the dog attacked another dog and also bit two children. Immediately it was placed into a box and brought to the laboratory.

The symptoms noted were those of extreme alertness and watchfulness with a vicious attack at any object thrust in his direction. No barking occurred until the third day, at which time it appeared normal in tone and not the characteristic tone produced when paralysis of the vocal cords and throat muscles has started. A small amount of food and water was consumed, respiration was accelerated, pupil dilated but would accommodate when placed in sunlight. Practically no change was noted in the symptoms presented until the evening of the fifth day, when a slight change in the tone of the voice was noted; the same degree of viciousness remaining. The morning of the sixth day a slight incoordination of movement was shown and by noon time paralysis had become general and the animal was unable to rise to its feet. The dog died on the evening of the sixth day, a positive diagnosis being established by microscopical examination.

We therefore have here a case of rabies which remained in the nervous, excitable or vicious stage of the disease for a period of six days, paralysis developing on the afternoon of the sixth day and death following within a few hours. It has been our experience that once symptoms are shown, paralysis is noted about the second or third day, death following on the third or fourth.

PETECHIAL FEVER

By ROY F. HESS, Ames, Iowa

Senior Veterinary Student, Iowa State College

The following case was assigned to me at the clinic of the Iowa State College, May 9, 1923.

A family driving mare, age 30, began showing the following symptoms, about a week previously: There were petechial and ecchymotic hemorrhages on the nasal mucous membrane and septum nasi. The oral mucous membrane and conjunctiva were anemic and the lips showed an ulcerative stomatitis. The limbs were edematous from the elbow to the fetlock and stifle to fetlock. The proximal border of the edematous areas showed definite demarcation. The limbs were about twice their normal circum-

ference and were quite sensitive when palpated.

The general condition was very bad, and the animal was emaciated and weak. Pulse, 48; respirations, 30; temperature, 101.2.

On May 10 there was a dark-brown, fluid discharge from both nostrils. The pulse was 50; respirations, 26; temperature, 100.8. The conjunctiva of the left inferior lid was congested, but the others showed no changes.

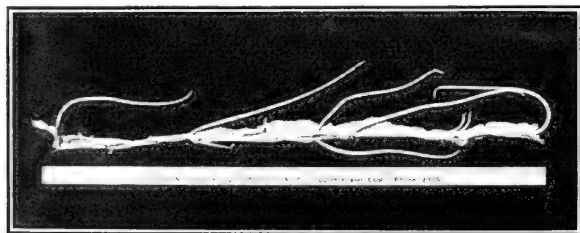
May 11. Pulse, 96; respirations, 32; temperature, 103.7. The animal was off feed, and the conjunctivae of both eyes congested. The bilateral nasal discharge was more copious and tinged with blood. The wings of the nostrils and the lips were edematous and about twice normal size. The swelling on the nose ended about where the nose-strap of the halter crosses the nose. The respirations were labored, and the edema of limbs more extensive.

The animal was destroyed without treatment. The case is reported with the thought that it might be interesting on account of the age of the animal, and the fact that a very typical case of purpura developed without any known predisposing factor being present, other than the extreme age and poor condition.

BIG ONES THIS TIME

By G. G. FABER, *Mitchell, S. D.*

The accompanying photograph shows a section of intestine about a yard long, taken from a hog, which showed an infestation with *Echinorhynchus gigas*, in which the specimens of this worm



Echinorhynchus Gigas

were unusually large. Cases have been seen in which the parasites were considerably more numerous, but in this case they appeared to be very large. One of the specimens measured slightly over $14\frac{1}{2}$ inches in length.

REVIEWS

TRAITE DE THERAPEUTIQUE CHIRURGICALE DES ANIMAUX DOMESTIQUES. (Treatise of the Surgical Therapeutics of Domestic Animals). P. J. Cadiot and J. Almy, Professors at the Alfort Veterinary College. 3rd edition. First volume, 979 pages, with 314 figures in the text. Published by Vigot Freres, Paris, 1923. Price 50 francs.

The book is divided into four parts, (1) dealing with general surgery, (2) affections common to all tissues, (3) affections of particular tissues, such as skin, serous membranes, etc., and (4) affections of different regions. Part one is divided into chapters on restraint, anesthesia, antisepsis, hemostasis, etc., in the different animals.

In this work the authors have maintained the high standard of excellence of previous editions. The preparation of the present work was started in 1915, and, as may be expected, has been subjected to many revisions. Its completion was greatly delayed on account of the unprecedented difficulties incident to the war. The authors, as well as the publishers, are to be congratulated upon the successful completion of their task.

LES MALADIES DU CHEVAL. (Diseases of the Horse). F. Breton and E. Larieux. Fourth edition, revised and enlarged. XXIV—498 pages. Published by Vigot Freres, Paris, 1923. Price 20 francs.

In this new edition the authors have not seen fit to change the form and style of previous editions, which met with the hearty approval of the profession. Several new chapters have been added: Bots, cutaneous habronemiasis, blood transfusion, general anesthesia, pyotherapy, electro-ionic medication, and quite a number of the newer operations. This book, which is one of a series, is really a hand-book and appears to offer, in a very convenient form, quite a fund of useful information for the busy practitioner.

ABSTRACTS

THE CAUSAL ORGANISMS OF BOVINE ACTINOMYCOSIS. T. J. Bosworth. Jour. Comp. Path. and Thera., xxxvi, (1923), 1.

The writer made pathological and bacteriological studies of 34 cases. Thirteen were due to a streptothrix. The others were associated with the actinobacillus. The latter group was similar to the organism described by Lignières and Spitz, in Argentine.

F. S. J.

BACTERIOLOGIC STUDY OF PNEUMONIA IN SHEEP. Robb Spaulding Spray. Jour. Inf. Dis., xxxiii (1923), 1, p. 97.

A detailed bacteriologic study of two types of pneumonia in sheep, under slaughter-house conditions, is reported. The first a rather edematous type, was found frequently in spring lambs, while the second, a purulent, chronic type, found only in older sheep, was often associated with lesions of caseous lymphadenitis (pseudotuberculosis).

Pasteurella ovisepticum was isolated, in mixed culture, from four cases of the edematous type and in pure culture from a castration abscess in a lamb. From one case of the chronic type of the disease in older sheep this pastuerella was isolated in pure culture once, and five times in mixed culture.

The morphologic and cultural characteristics of the true *Past. ovisepticum* are described, special emphasis being laid on the odor produced and the appearance of the surface colonies on plain- or blood-agar plates, as a means of diagnosis of the pastuerella group.

Two groups of organisms, closely related, and very similar to the true pasteurella type, were frequently isolated in pure or mixed culture from the lambs and once in mixed culture from old sheep. These two types were differentiated by a slight difference in growth in glycerol, and by agglutination and absorption tests. They were separated from the true pasteurellas by their action on blood agar, maltose and glycerol. Intermediate strains, which seemed to connect these two strains together and to the true *Past. ovisepticum*, were also isolated.

A gram-positive diplococcus was isolated a number of times from suppurative, pneumonic areas, associated with lesions of caseous lymphadenitis in the older sheep. This organism was distinguished from the common infections streptococcus by its proteoclastic activity on milk, gelatin and blood serum.

A gram-negative diplococcus of the type *M. catarrhalis* was isolated in pure culture from two cases of pneumonia in lambs, in mixed cases from several more and from two cases of pneumonia in older sheep in mixed culture.

The true *Past. ovisepticum* was found to be highly pathogenic for mice, guineapigs, and rabbits.

The intermediate strains, which seemed to connect the true pasteurella to the pasteurella-like organisms found in these conditions, were highly pathogenic for mice and guineapigs, but less so for rabbits. These two strains cross-agglutinated to full

serum titre and mutually cross-absorbed agglutinins, and were found to be identical in cultural characteristics with Giltner's non-virulent organism called "atypical *B. ovissepticus*."

S. S.

A DIPLOCOCCUS ASSOCIATED WITH CASEOUS LYMPHADENITIS AND PNEUMONIA OF SHEEP. Robb Spaulding Spray. Jour. Inf. Dis., xxxiii (1923), 2, p. 161.

Infection of the thoracic lymph-nodes, simulating "ovine caseous lymphadenitis," was observed frequently accompanying a chronic type of pneumonia in sheep.

The lesions in the lymph-nodes were characterized by an accumulation of greenish, creamy to caseous pus, contained in a thickened capsule of connective tissue which, to a large extent, replaced the normal lymphatic tissue. In many cases the condition extended to the lungs, often leading to an extensive necrosis of almost an entire lung, which showed areas of encapsulation enclosing large quantities of a semi-fluid, necrotic mass made up of many leucocytes and lung tissue in various stages of disintegration.

A gram-positive diplococcus was found in these lesions, either in pure culture or associated with *Pasteurella ovissepticum*. This organism was only slightly hemolytic when isolated, but become more actively so on cultivation. It rapidly liquified gelatin and Löffler's serum, and peptonized milk without coagulation. Injections of cultures were fatal to white mice and guinea pigs and in one instance each to a kitten and a puppy. In all cases, lesions found in the liver of these animals were similar to the lesions in sheep, from which the organisms were originally isolated.

Injections into rabbits were followed by negative results, the author concluding, from a few experiments, that the organism was not pathogenic for these animals. All strains were identical agglutinatively. Antiserum for three strains protected white mice against doses of the homologous strains fatal to unprotected mice.

Reviewing the literature on pyogenic infections of sheep, the author concludes that this is probably an undescribed diplococcus which may be regarded as at least a complicating factor in ovine lymphadenitis and in certain types of sheep pneumonia.

S. S.

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of Sixtieth Annual Meeting, Montreal,
Canada. August 27 to 31, 1923.

(Continued from p. 255, November Journal)

TUESDAY AFTERNOON, AUGUST 28, 1923

The meeting convened at 2:45 p.m., President Welch presiding.

PRESIDENT WELCH: Gentlemen, will you please come to order? The first thing is a report from the Executive Board.

DR. WAY: The report as presented by the Secretary yesterday constitutes the work that the Board has completed up to the present time. Therefore, we simply have to report progress, and will have the final report at the next general session.

PRESIDENT WELCH: Gentlemen, we have now arrived at the time for the election of officers for the ensuing year. Remember, kindly, that the time for presenting the claims of your candidate is limited to two minutes. Also, in voting, kindly remember that only those whose dues are paid for the current year are entitled to vote. I will declare nominations in order for President for the ensuing year.

DR. J. G. FERNEYHOUGH: I find myself, gentlemen, in a rather embarrassing position up here. This is the first time I ever left the United States to come into Canada, and I have had a delightful time, but yet I am bound to get on my feet to nominate a man from the old United States. It places me somewhat in a position that reminds me of a joke told down in our country, soon after the Civil War.

A darky down there thought he would take things by storm, so he dressed up in a dress-suit, ran up and down the streets of Richmond, and fired a gun several times. Some parties came out and shut him up and hung him up on a post in the middle of the street, and wrote across his white shirt front, "*In statu quo.*"

Everybody who came along wanted to know what that meant. They sent for a school teacher to come and decipher the meaning. He said, "Gentlemen, I am a little rusty on my Latin, but I believe I can tell you what it is. It means, 'I am in a hell of a fix.'" (Laughter.)

Now, the Canadian people have treated us so nice, and that adds to my embarrassment.

Gentlemen, I am going to present to you Dr. C. H. Stange, of Ames, Iowa, as your next President. (Applause.)

In so doing, I am not taking any chances. I know I am putting before you a man who has done much for the profession and still more for the practitioner. Gentlemen, it is up to us to take care of our profession. I understand a gentleman is going to be nominated here, from Canada, and I wish to goodness I could vote for him, too. He is a splendid fellow. It will soon come back East and then Canada can get it. It looks as if the convention is going West this next year, and let's give the honor to the man in his own country.

DR. C. A. CARY: I do not wish to take much of your time.

I pride myself on being an American who has been a member of this Association since it was changed from the United States Association to the American Association, to take in all the Western Hemisphere. I am proud of the fact that this Association represents North and South America and all the islands in the Western Hemisphere. We are today meeting in the land of the Canadian, the Canadian who has stood by this Association and has had two Presidents. I believe it would be a great honor to elect a Canadian to go down to the State of Iowa and preside. (Applause.)

I am an Iowa man by birth, and I have enough magnanimity in me to extend the hand across the line and say, "God bless you, Canada."

Therefore, I nominate a man who has been Assistant Veterinary Director-General of this great country of Canada, who bids fair to be appointed to the highest position in the veterinary profession in this country, and I say, as an American and as a United States man, I consider it a great honor to nominate Dr. George Hilton, of Canada, for President of this Association. (Applause.)

DR. D. H. UDALL: Mr. President, Gentlemen of the Association. This selection of a president of the Association is a cold-blooded matter. We cannot afford to let our decision rest upon personal regards, patriotism or honorary positions. We have reached the point where we wish to offer our positions to every single man, whom we can draw into them, of the highest ability. We already have within the Association the man who was nominated by Dr. Cary, and he is doing a tremendous work for the Association. Let us appreciate and thank him for his services, and continue him on the job.

Our Association is not large enough now, our interests are not so extensive but what we must look at this in a purely

cold-blooded manner, and keep the best man in the best place for which he is fitted at the present time and disregard honorary matters.

The man who was first nominated for President, Dr. Stange, is a man of wide experience, a man of great administrative ability, lives in the center of this country most densely populated by veterinarians, is a man who has been in touch for years with the matters pertaining to veterinarians. I believe he is a man eminently fitted for the position; therefore, I take great pleasure in seconding the nomination of Dr. Stange.

DR. A. H. BAKER: I was very pleased to hear the member from the United States propose as President one who is a resident in Canada. I don't ask support for him because he is a Canadian, but I do feel I can ask for his support because he has taken a very prominent part in every way in the affairs of the Association. I think Dr. Hilton has shown by his past history that he appreciates what this Association stands for, and I think that he would fill the position of President with a great deal of credit to the Association, and as well to the country of which he is a citizen.

I take great pleasure in seconding the nomination of Dr. Hilton as President of this Association. (Applause.)

DR. D. S. WHITE: Mr. President, Veterinary medicine in North America knows no international boundary. After all, while we may serve under different flags, we are all Americans. One of the most delightful experiences of my months in France was to visit the Canadian Unit, a veterinary unit. The commanding officer insisted upon accompanying me, through the mud, back to my automobile, through a downpour of rain, for a mile and a half. I said to him, "There is no need of your doing this."

He said, "I would like to go with you."

I said, "Why?"

He said, "I have been out here in this mud and rain for four and a half years, and you are the first man from God's country who has visited my command." He was a Canadian, and I from the United States.

Whether Dr. Hilton or Dr. Stange be elected to the presidency of this Association will mean that a good man will be at the helm. However, I believe, on account of his long and faithful and efficient service, on account of his administrative ability, and for the reason that he represents the front rank of the new

crop of veterinarians who must come on and take the places of those of us who have rendered our service, I, therefore, take great pleasure, for the reasons given, in seconding the nomination of Dr. Stange for President. (Applause.)

DR. W. L. THAYER: I would like to second the nomination of Dr. Stange for President.

DR. STEEL: Mr. President, Gentlemen: As a practitioner from Iowa, as a practitioner from the Central West, I wish to second the nomination of Dr. Stange for President of the Association. Dr. Stange has the full confidence of the practitioners in Iowa, and, as Secretary of the Iowa Association, I place a great deal of reliance in his advice. At this particular time, when you are expecting to do things for the practitioners, we feel that you should put this in the hands of a man whom we feel capable of guiding our affairs. I know Dr. Stange to be very conservative. In these trying times we need a conservative man in the chair. As a practitioner from Iowa, I want to say that he has the hearty endorsement of the practitioners in that state. (Applause.)

. . . Dr. F. T. Daubigny, speaking in French, seconded the nomination of Dr. Hilton . . . (Applause.)

PRESIDENT WELCH: Are there any further speeches? If there are no further nominations, I will declare the nominations closed. While we are waiting for a black-board, on which to write the names of the Vice-Presidents, I think it would be wise to elect our Treasurer. I will, therefore, declare nominations for Treasurer in order.

DR. C. WAY: Mr. President, it is no use for me to make any long-winded speech for the candidate for Treasurer. We have a custodian of the funds who has acted as a chancellor of the exchequer for four or five years. His accounts have always been above criticism; he is bonded to the fullest extent of the law, and he has served well and faithfully.

I want to place in nomination Dr. Jacob, of Tennessee. (Applause.)

DR. CARY: I want to second that nomination.

DR. L. A. MERILLAT: I want to second that nomination.

. . . It was voted, on the motion of Dr. J. T. Hershheim, duly seconded, that the nominations be closed . . .

DR. CARY: I move the by-laws be suspended and the Secretary authorized to case a unanimous ballot for Dr. Jacob.

. . . The motion was seconded and unanimously carried.

Secretary Hoskins cast the ballot for Dr. M. Jacob, for Treasurer for the ensuing year . . . (Applause.)

Secretary Hoskins read a telegram received from Dr. W. C. Woodward, the Secretary of the Bureau of Legal Medicine of the American Medical Association:

"Will not the American Veterinary Medical Association appoint a committee to act for it in the development and enactment of federal and uniform laws to regulate the sale of clinical thermometers? The American Medical Association, the Federal Bureau of Standards and manufacturers are interested in this movement."

SECRETARY HOSKINS: You will recall yesterday three or four communications were reported from Dr. Woodward, and I take it that it is an indication that the American Medical Association believes that the cooperation of this Association is worth having in a number of these legislative matters which are before us at the present time.

PRESIDENT WELCH: Dr. Frank Hayden desires to speak to us a moment.

DR. HAYDEN: Thank you, Mr. President, for this opportunity to say a word in reference to this telegram which has just come in. I know nothing as to why it came, but as I represent Becton, Dickinson & Co., a leading manufacturer of clinical thermometers, I do know something of the conditions which prevail in the country concerning clinical thermometers, which make this telegram very opportune.

For years there have been many undependable instruments marketed, so much so that the states are recognizing the situation and many of them are considering a set of specifications or regulations pertaining to the clinical thermometers that may be marketed within that commonwealth or state.

If this is followed out, it will bring about a different set of specifications in each state; so it is desirable (rather than have forty-eight different codes—meaning that if you buy a thermometer in one state and step across the border into another, your instrument may be confiscated and you may be under the ban of some criminal law) that a Federal statute be enacted covering the entire country, and this telegram is toward bringing about this condition. It would give us one law rather than forty-eight covering this situation.

PRESIDENT WELCH: Gentlemen, we will proceed with the nominations for Vice-President. There are five to be elected.

You may nominate as many as you choose, from any district of our jurisdiction. The five receiving the highest number of votes will be elected. I will declare nominations in order for Vice-President.

DR. COTTON: I wish to nominate Dr. H. E. Kingman, Fort Collins, Colo.

DR. C. S. CHASE: I wish to nominate a man who for twelve successive years never failed in the performance of his duty as Secretary and President of the New York City Association, Dr. Robert S. MacKellar.

DR. W. M. BELL: I want to place in nomination a gentleman from the South, Dr. Hamlet Moore, of New Orleans.

DR. H. W. TURNER: I nominate Dr. J. G. Ferneyhough.

DR. H. E. BEMIS: I nominate Capt. R. A. Kelser to represent the Army Service.

DR. N. S. MAYO: Mr. President, I would like to place in nomination one representing our French-speaking members, Dr. F. T. Daubigny, of Montreal. (Applause.)

DR. H. S. MURPHEY: I would like to place in nomination a man representing nearly the East, or close to it, Dr. Henry W. Turner, of Pennsylvania.

DR. J. T. GLENNON: I second the nomination of Dr. MacKellar.

. . . Dr. F. W. Morgan, of Tennessee, was nominated. . . .

DR. J. H. BLATTENBERG: I will second Dr. Moore's nomination.

. . . Dr. Ferneyhough's nomination was seconded. . . .

DR. A. T. KINSLEY: I would like to place in nomination Dr. G. H. Hart, of California.

DR. MAYO: I think we have a good array to vote for, and, if there are no more nominations, I move that the nominations be closed.

. . . The motion was seconded and carried. . . .

PRESIDENT WELCH: Gentlemen, I will let you hear the results of the election for President. There were 244 votes cast. Dr. Stange received 146 and Dr. Hilton 98, Dr. Stange, having received the higher number of votes, I will declare him elected President of this Association for the ensuing year. (Applause.)

DR. GEORGE HILTON: Mr. President, if I am in order, I would like to be one of the first to congratulate Dr. Stange on his election. I wish to state I am not out of a job, and I want to assure him that, as a member of the Executive Board, I shall

be only too glad to give my whole-hearted support to any measures that may come before that Board for the advancement of this Association. (Applause.)

DR. C. A. CARY: I want to move that the vote for Dr. Stange be made unanimous.

DR. A. H. BAKER: I second Dr. Cary's motion.

. . . The motion was carried. . . . (Applause.)

PRESIDENT WELCH: Gentlemen, it gives me great pleasure to present to you your new President, Dr. Stange, of Iowa. (Applause).

DR. STANGE: Gentlemen, I find it difficult to locate words with which to express my appreciation of this honor. I regard it as an honor and recognition, more of the veterinarians of the State of Iowa, than as a personal one. I deeply appreciate the words spoken by Dr. Hilton, who is one of my best and warmest personal friends. I am very glad that there was no personal feeling whatever in this matter. I want to assure the members of this Association that the work of the organization will receive my best efforts, and all I ask for is your cooperation.

Again thanking you, I hope that next year will be a successful one. (Applause.)

PRESIDENT WELCH: Now, gentlemen, there are nine nominees for Vice-President, five of whom are to be elected. You will vote for five men — no more — and the five receiving the highest number of votes will be elected. They are Dr. Kingman, Colorado; Dr. MacKellar, of New York; Dr. Hamlet Moore, of New Orleans; Dr. Ferneyhough, of Virginia; Capt. Kelser, of the Army; Dr. Daubigny, of Canada; Dr. Turner, of Pennsylvania; Dr. Morgan, of Tennessee, and Dr. Hart, of California.

I will appoint as tellers, Dr. Mayo, Dr. Watson, and Dr. Hershheim.

PRESIDENT WELCH: Gentlemen, at this time it has been customary to extend the floor to representatives of different cities who wish to extend to us invitations for the meeting the following year. The place of meeting is decided by the Executive Board, but this precedent of ascertaining the desires of the Association has been a custom, so I will yield the floor at this time to the representatives of the different cities.

DR. E. R. STEEL (Iowa): As Secretary of the Iowa State Association and in behalf of that Association, I wish to extend to the American Veterinary Medical Association an invitation

to hold its 1924 meeting in Des Moines. We have in Iowa approximately 800 graduate veterinarians, or one-tenth of the veterinarians of America. We have in the adjoining states approximately thirty-four per cent of the graduate veterinarians of America. We feel that we would like to entertain the American Veterinary Medical Association next year.

Our State Association has asked me to invite you there. We have invited you for the last several years, and this year we think you ought to come to Des Moines in 1924. We have in Iowa one of the strongest state associations in this country. We have some 550 active members, and at our meetings we have some 500 or 600 members. We feel that we can give the national association more new members and more new life next year than any other section of this country. We have an ideal convention city. The city of Des Moines, about one hundred thousand population, has ample hotel accommodation, ample facilities for holding the meetings of the different sections. We also have a splendid place to hold a clinic, at the Iowa State College. We think in Iowa that the Iowa State College is one of the best in the world. So I wish to extend this invitation, on behalf of the Iowa Association, and would recommend Des Moines, Iowa, as the place for the next meeting of the American Veterinary Medical Association. (Applause.)

DR. A. T. EVERETT: Mr. President, I wish to extend an invitation for the next meeting of the Association in 1924. Omaha would really be an appropriate place for the next meeting, because Omaha is the mother of the American Veterinary Medical Association.

The American Veterinary Medical Association was organized in '98, when the United States Veterinary Medical Association ceased to function. Omaha would like to see its baby grown to manhood, and asks for the meeting in 1924.

We have every facility there. We have a city of 225,000. We have between thirty and forty veterinarians of the State in that city. It is the fourth largest railroad center in the United States. It is the third largest in live stock industry in the United States. We have one of the largest horse markets at Omaha. In our present market there are from six to seven hundred horses sold at auction every week. That would, of course, interest the gentlemen here. We have a large pavilion that would accommodate the clinics. The Live Stock Exchange

will do all they can to help the city of Omaha entertain the Association, if you meet there. (Applause.)

DR. BEMIS: At the request of President Pearson, of the Iowa State College, and Dean Stange, of the Veterinary Division of that College, and the entire veterinary faculty, I wish to extend an invitation to this Association to come to Des Moines, seconding Dr. Steel's remarks.

Des Moines is thirty-five miles south of Ames, at which place the Iowa State College is located. We have anticipated your coming—I will be honest with you—for some time. We have hoped sincerely that you might come to Des Moines in order that we might have an opportunity to have you come to the Iowa State College, and to visit the Veterinary Division in particular.

I want to assure you that the entire college, which is composed of five divisions, engineering, agriculture, general science, home economics, and veterinary science, will more than welcome you and will turn over every facility for your pleasure, instruction and entertainment.

If you do come, I promise you that the veterinary faculty in particular will put forth every possible effort, and the entire veterinary population of the State will cooperate with the college in putting on a clinic or clinical demonstrations which we feel should be of benefit to the Association.

We could plan to have one day at the College, which will take only a short run on the interurban or train between the two cities.

I sincerely hope you will decide on coming to Des Moines, and that we may have the pleasure of your coming to Iowa State College. (Applause.)

PRESIDENT WELCH: Gentlemen, what is your pleasure? Is it your desire to instruct the Executive Board to act in this matter?

DR. STEEL: I move this Association recommend Des Moines, to the Executive Board, for the 1924 meeting.

DR. J. I. GIBSON: I second the motion made by Dr. Steel.

DR. EVERETT: Iowa has the honor of getting the presidency; I think Omaha ought to have the meeting in 1924.

PRESIDENT WELCH: Gentlemen, it is moved and seconded that we recommend to the Executive Board that the meeting be held in Des Moines in 1924. All those in favor of the motion will signify by saying "aye"; opposed, "no".

. . . The motion was carried. . . .

PRESIDENT WELCH: I might say in this connection that Dr. Simms, of Oregon, would like to extend an invitation for us to go to Portland in 1925.

DR. B. T. SIMMS: Mr. President, Gentlemen, in coming before you this afternoon, I represent a section of the country that in the sixty years of the existence of the American Veterinary Medical Association has not had one meeting. From Portland, Oregon, the nearest point to which any meeting during this sixty years has come is more than seven hundred miles away, and, with the exception of two meetings, we have not had one within one thousand miles of the Pacific Coast Northwest.

We realize that we don't have the large number of veterinarians found in the Corn Belt, and we don't expect that the meeting will come to the Northwest every three or four or five years, but we do have a great enough representation on the Coast that we could reasonably expect one meeting in sixty years, and we are extending an invitation to the Association now.

When I say "we", I mean the associations of British Columbia, Washington, Idaho, Oregon, as well as others who have expressed a desire to have the meeting come out there. Although they have not expressed it as an association, they have expressed it personally.

I come representing the Northwest, and ask that in 1925 the Association come to Portland, Oregon. Come out and see the Pacific Northwest, and give us fellows a chance to attend one meeting without having to travel one or two thousand miles.

Last night I estimated that I would have traveled some seventeen thousand miles in attending the last seven meetings of the American Veterinary Medical Association. You see, then, why we do not have large representations from those sections.

As to what we will have in the way of attractions out there, you know, of course, that the Pacific Northwest has come to be known as the "Playground of America" during the summer months. We have a good climate, wonderful scenery, good hotels, good automobile roads leading over the country, wonderful fishing and hunting for those who care to make a vacation along with the trip. We don't want to enter a fight with other sections for this meeting. We hope by extending the invitation that other cities and other groups of men will hold back and leave 1925 for Portland, Oregon. I thank you. (Applause.)

(To be continued)

REPORT OF THE MEETING OF THE WOMEN'S AUXILIARY TO THE AMERICAN VETERINARY MEDICAL ASSOCIATION IN MONTREAL, AUGUST 28, 1923

The Montreal meeting of the Women's Auxiliary to the American Veterinary Medical Association was thoroughly enjoyed by the seventy-five ladies who attended. We were heartily welcomed to Canada by Mrs. M. C. Baker, of Montreal, after which our president, Mrs. G. A. Johnson, gave a splendid address stressing the importance of the Auxiliary and making known the conditions of the Loan Fund.



MISS ANN LORRAINE BLATTENBERG

An opportunity to join was given those present, who did not belong to the Auxiliary. Twenty-two new members were added to our ranks, and all were very enthusiastic and eager that the splendid work being done by the organization should continue to grow in usefulness.

An invitation for a representative of the Auxiliary to come before the general session of the American Veterinary Medical Association was accepted. The object being to tell the men about the Loan Fund in order that its purpose might be more generally known and thus their interest in it aroused. This

was very ably done by Mrs. H. P. Hoskins, of Redford, Mich. (Mrs. Hoskins' address will appear in the JOURNAL, in the proceedings of the Tuesday afternoon session.)

Mrs. R. P. Marsteller of College Station, Texas, was appointed secretary to fill the vacancy caused by the resignation of Mrs. F. A. Lambert of Columbus, Ohio.

The meeting was then turned over to the local ladies who entertained us with music and readings.

A rising vote of thanks was given the ladies of Montreal for the very cordial and royal hospitality extended to us and the meeting closed with the singing of "Old Canada."

The rules governing the Loan Fund will be published in the next issue of the JOURNAL.

Mrs. R. P. MARSTELLER, *Secretary*

Among those admitted to the Auxiliary at the Montreal meeting was Miss Ann Lorraine Blattenberg, of Lima, Ohio, who enjoys the double distinction of being the daughter of a very distinguished veterinarian, Dr. J. H. Blattenberg, and at the same time the youngest member of the Auxiliary. Not content with these honors, she recently won first prize in a contest with over two hundred other babies, whose pictures were judged by a Cleveland (O.) art company. The prize was fifteen dollars in gold.



SNAPPED AT MONTREAL

Left to right: Dr. E. A. Watson, Lady Theiler, Professor Porcher and Sir Arnold Theiler.

(Photo by Miss P. E. Gysel)

A PROPOSED POLICY FOR THE A. V. M. A.

The following is a draft of the proposed policy of the American Veterinary Medical Association, as presented at the Montreal meeting by the Executive Board. The outline of this policy was drafted by the Committee on Policy, consisting of Drs. Munce, Chairman, Welch, Merillat, Udall, Mohler, Jacob, Cotton and Hoskins, Secretary, this committee having been appointed for this purpose early in the year.

This policy was not adopted at the Montreal meeting, for the reason that it appeared to be the concensus of opinion that such an important step should not be taken without very calm and mature deliberation, or before an opportunity was given the membership at large to read and study our proposed policy. It was with this purpose in mind that the convention voted to have the proposed policy published in the JOURNAL at some time prior to the 1924 meeting, to be held in Des Moines.

It is being published this month, with the thought that members will have an opportunity to read and discuss it in its various aspects at the numerous meetings of state associations, which will be held during the next few months. It is only by close study and free discussion that the salient features of this proposed policy will be brought out and better understood, so that when it comes up for final adoption, next year, our members will be in a position to vote intelligently—something that could not be expected unless an opportunity has been afforded for reading and studying a draft of the policy beforehand.

FOREWORD

The members of the American Veterinary Medical Association and others interested in the profession often have need of an expression of the opinions, policies and principles of the Association. They wish to know where it stands on matters affecting various interests and what approval, support or opposition may be expected from it for any program affecting the relation of the veterinarian to the public welfare.

It is apparent that this profession is in the midst of an evolutionary period destined to bring about a material change in its relation to economics of modern life. The American Veterinary Medical Association must ever serve the interests of the public, as well as those of the profession. The trend of modern events

demands a capable readjustment of her activities in keeping with other organizations.

In order to avoid misunderstandings, to assist in the passage of wise legislation, recommendations and regulations, to encourage high professional ideals, and to furnish wise counsel and guidance, it is believed that the Association should have and support a definite policy with reference to any subject that may assume importance to the members of the profession.

The Association, therefore, assumes the position of endorsing a definite policy setting forth its purpose and containing recommendations pertaining to the important subjects of agricultural extension, veterinary education, legislation, public health, allied organizations, publicity, regulatory service, veterinary biologics, humane measures and preventive medicine.

The purposes of the American Veterinary Medical Association are to promote and protect the interests of the veterinary profession; to raise the requirements of veterinary education; to procure the enactment of uniform laws and regulations governing the control of animal diseases; to carry out the enforcement of these laws and regulations; to encourage public opinion through various means regarding problems of animal hygiene; and to promote good fellowship in the profession.

AGRICULTURAL EXTENSION

Agricultural extension has for its basic object the promotion and improvement of all phases of agricultural activities. The live stock industry is a most important integral part of agriculture; thus agricultural extension service comes into close touch and relationship with the veterinary profession. Each has a definite and proper sphere of activity; and encroachment of one upon the prerogatives of the other will work disaster.

The limitations of the agricultural extension service may be very properly classified as strictly educational and promotive in character. The work of promotion in the development of better live stock is a part of the proper field of activity of the agricultural extension service, and to this work should be given the hearty cooperation of the veterinary profession.

On the other hand, the problem of protecting those animals from disease and rendering aid to the sick, as well as sanitary and regulatory measures for disease prevention and control, rightfully become the prerogatives of the veterinary profession. The prevalence of or our comparative freedom from such diseases

as hog cholera, anthrax, blackleg and tuberculosis will depend largely on the character of the support given to our profession by the agricultural extension service.

The Association should:

1. Support every effort of the Agricultural Extension Service to increase the production of a better class of live stock, particularly urging the exclusive use of pure-bred, registered sires of good type and conformation and lend every assistance to the establishment of pure-bred herds and flocks.

2. Emphasize the value of sanitary surroundings for animals, the value of proper nutrition and the advantages of orderly marketing.

3. Encourage the establishment of calf, pig, sheep, colt, poultry, corn and other agricultural clubs among the boys and girls.

4. Encourage the promotion of racing, endurance tests and better live stock shows.

5. Cooperate with the various agricultural extension agencies for the betterment of agriculture and the live stock industry.

6. Make provision for a representative of this Association to attend each annual conference of Agricultural Extension Directors.

7. The Association should maintain a correct relationship with all the important pure-bred live stock associations, working with them for the improvement of live stock and the control of transmissible diseases.

8. Veterinarians affiliated with agricultural colleges and agricultural extension services should confine the instruction and advice given to agricultural students and live stock owners on veterinary subjects to:

- (a) The fundamental principles of live stock sanitation;

- (b) First aid, and

- (c) The value of employing competent veterinary services in the diagnosis, prevention and treatment of animal diseases.

VETERINARY EDUCATION

The standard and quality of a veterinary college is dependent upon the ability of its teaching staff, its entrance requirements, the ability of its student body and the perfection of its physical equipment and clinical facilities. The character of service that the college may render and from which its value to the live stock industry may be estimated is directly reflected by the graduates of the institution. If the profession is to rise to the highest

point of service to the live stock industry, preliminary education in subjects directly allied to veterinary medicine must be stressed, while membership in the various veterinary medical associations and post-graduate work for keeping up-to-date are essential.

States contemplating the establishment of veterinary education are advised to provide scholarships for prospective students that will enable them to attend recognized and qualified institutions already established in other states.

Undergraduate veterinary education should be conducted only at institutions approved by the American Veterinary Medical Association.

Faculties of the different colleges in the United States and Canada should correlate their schedules and curricula so that a student may transfer from one college to another with a minimum loss of time and credit.

LEGISLATION

All ills cannot be cured by legislation; much still depends on individual effort through the rendering of efficient service, whether private or public. The Association offers a word of caution against over-legislation. The Association should render assistance in the enactment of all legislation affecting the public's interests.

The Association has a Committee on Legislation, the activities of which have been confined almost entirely to national problems. This Committee should be continued and means be provided so that its activities may be extended to provincial, state and local conditions.

REGULATORY SERVICE

No laws or regulations will succeed in controlling diseases of animals unless veterinarians and owners of live stock are sufficiently interested and familiar with them to assist in such control.

Government control of animal diseases has extended so that those actively engaged in any branch of the veterinary profession have of necessity dealings with state, provincial and federal authorities. In order to promote a better understanding between private practitioners and regulatory officials and to permit greater freedom of individual effort, it is advisable that the following principles be observed.

(1) This Association recognizes the right of the states and provinces to employ veterinarians for the purpose of giving

free professional service for the control of communicable diseases. It does not approve of the state or province denying any class of qualified veterinarians the right to render such service. The word "service" as used here refers to the actual performance of routine work, such as the application of diagnostic methods, treatment, etc., and does not refer to administrative regulatory service.

(2) When state, provincial and federal governments authorize the work of any duly qualified class of veterinarians who have met state, provincial and federal requirements, there should be no discriminatory regulation against their services. When indemnities are paid to owners for animals slaughtered because of infectious diseases, such indemnities should not be limited to animals condemned only by veterinarians regularly employed by the federal, state, county or provincial governments, but should be paid when such animals are disclosed as a result of a diagnosis of any qualified veterinarian authorized by the state or province, provided state or provincial and federal regulations governing the same are complied with.

(3) It is the opinion of this Association that the general use of special county, state, federal or provincial employes for the performance of routine work, like tuberculin testing, where animal husbandry is developed and qualified private practitioners are established, is not a wise permanent policy in the control of animal disease.

PUBLIC HEALTH

This Association recognizes the well established facts concerning the transmissibility of certain diseases of animals to human beings. The veterinarian should continue to render every possible service to health officials by supplying information with reference to animal diseases.

The relation of the veterinary profession to public health is important. The function of the veterinary profession is two-fold. First, to protect the health of animals, thus rendering their products salable and safe for human consumption. Second, to safeguard public health by the control of animal diseases transmissible to man, and by the inspection of animal food products.

The veterinary profession should commit itself to the policy of promoting the use of healthy animals and healthful animal products. This Association commends and encourages the con-

sumption of milk and milk food products from tuberculosis-free herds.

ALLIED ORGANIZATIONS

The term "allied organizations" refers to all associations and societies actively interested in the problems of agriculture, live stock improvement, and public health. The veterinary profession through its membership should be identified with those organizations and participate in their deliberations whenever practicable, make provision for a representative of this Association to attend the annual conference of allied organizations and invite representatives of such organizations to attend the annual convention of this Association.

The Committee on Policy of this Association should confer with the Committee on Policy of the United States Live Stock Sanitary Association, in an endeavor to harmonize policies and activities that may be of mutual interest and benefit.

PUBLICITY

The scientific and learned professions have been among the last groups to avail themselves of channels of publicity and have adopted such means to a less extent than other interests have done.

The policy of this Association should be to promote and carry on ethical publicity, calculated to improve the service of the veterinary profession.

HUMANE MEASURES

1. Probably no more useful service has been rendered mankind than that which has been accomplished through animal experimentation. The advancements in bacteriology and physiology have been brought about mainly through such experimentation. Without the knowledge which has been gained in these two subjects, veterinary as well as human medicine would have been greatly handicapped.

2. This Association should support humane measures and assist in teaching and guiding the public mind in correct methods of handling animals humanely.

VETERINARY BIOLOGICS

1. It appears desirable that this Association establish, in cooperation with the Federal Bureau of Animal Industry and producers of veterinary biological products, a classification of

veterinary biologics, whereby the veterinary practitioner may be guided and the live stock industry protected.

2. It is recognized by this Association that in the diagnosis, prevention and treatment of diseases of live stock, certain biologics are efficient, whereas others are in the experimental stage and still others are worthless. (This Association cannot endorse any biological product until its efficacy is definitely proven.)

3. Scientific research workers and producers of biologics have organizations of laboratory workers for the purpose of standardizing biologics, methods of production and nomenclature. These organizations have signified a desire to cooperate in every way with the A. V. M. A. for the improvement and standardization of biologics and the elimination of products that are proven inefficient. The Association recognizes and commends this constructive work, which was taken up by the manufacturers upon their own initiative and hereby endorses and encourages a continuance of this work.

PREVENTIVE MEDICINE

Recognizing that prevention is the essential factor in the control and eradication of disease, this Association is committed to a policy of more general use of every established prophylactic measure.

The Executive Board recommends the approval of the foregoing policy by this Association, and further that the following committees be maintained:

First: A Committee on Policy consisting of five members selected as follows: The President, the Secretary, the Treasurer, the Chairman of the Executive Board and one member to be appointed by the President.

Second: A Committee on Veterinary Biological Products, to consist of five members selected as follows: A representative of the producers of commercial biological products; a representative of the Federal Bureau of Animal Industry; a veterinarian conducting research work not connected with a commercial concern; a general practitioner, and a state or provincial regulatory official.

The hen is of more value to this country than Henry. Ford continues to cater to our restlessness but hens added over a billion dollars to our wealth last year by sitting still.—*Life*.

L O S T

Below is given a list of members of our Association, for whom we have no correct addresses. First-class mail, sent to these members at the addresses given after their names, has been returned by the post office, undelivered. The Secretary will be very glad if any of our members can furnish correct addresses for any of these men.

Allen, Dee L., Macksville, N. C.
Allen, Frank E., 2410 Mission St., Spokane, Wash.
Batchelder, Lawrence H., Concord, Mass.
Booth, T. O., 414 Montana Ave., San Antonio, Texas.
Bostrom, G. A., Wahoo, Nebr.
Bourland, C. C., 2846 West St., Ames, Iowa.
Boyd, Geoffrey A., Cheyenne, Wyo.
Brach, Max W., Nashotah, Wis.
Brand, J. M., 220 Golden Gate Ave., San Francisco, Cal.
Calhoon, Harry L., Reese, Mich.
Carpenter, Peter F., 417 Conover Bldg., Sacramento, Cal.
Cohen, M. W., 15 Sanborn Ave., Somerville, Mass.
Evans, A. C., Goodland, Kan.
Francoise, Wm. I., 153 Winfield Ave., Detroit, Mich.
Glaisyer, E. L., Tillamook, Ore.
Gunster, Francis, Portland, Ore.
Herbott, Walter K., Fort Sheridan, Ill.
Hinkley, Kenneth F., Fort Myer, Va.
Holton, Daniel J., Camp Travis, Texas.
Howe, Harry H., Fort McKinley, Rizal, P. I.
Hughes, M. J., 128 W. 53rd St., New York, N. Y.
Johnson, Walter T., Houston, Texas.
Juckiness, Ed. M., 2026 Bissell St., Chicago, Ill.
Kellogg, Edgar A., Argentine, Kans.
Kielsmeier, S. G., 5th Cavalry, Marfa, Texas.
Lent, Ernest E., 1921 Nelson St., Chicago, Ill.
Lovell, Roy, San Ysidro, Cal.
Mathews, E., 187 Grand St., Jersey City, N. J.
Miller, Melvin W., Box 793, Price, Utah.
Mosley, Thomas, Duncan, Okla.
Neilson, Norman, 735, 79th St., Portland, Ore.
Noyes, Orrin W., 3709 Garfield Ave., Kansas City, Mo.
Noyes, Ralph E., Hammond, La.
Peterson, Wm. C., 408 Live Stock Exch., So. St. Paul, Minn.
Randall, Thos. E., Owenton, Ky.
Rostetter, B. F., Franklin, Texas.
Schandan, Theo., Fort Bliss, Texas.
Shipley, Michael, La Cruces, N. Mex.
Soneral, William, Ferndale, Wash.
Trigg, W. S., Health Office, Portsmouth, Va.
Verduin, Francis J., 956 Mound St., Milwaukee, Wis.
Webster, Charles, Opelousas, La.
Welf, Oliver H., Herald Ave., Mantua, Ohio.
Wende, John A., 503 Masten St., Buffalo, N. Y.
Williams, N. F., 2116 Croay St., Dallas, Texas.

Some folks are so intent upon the extermination of the horse that they have even revamped the old saw to read: "Money makes the car go."

OTHER MEETINGS

THE RECENT WORLD'S DAIRY CONGRESS

After years of planning, the World's Dairy Congress convened in Washington, on October 2. This was a combined congress of the leaders in research, education and business. The United States took the initiative by forming a temporary organization of dairy students and industrial leaders in October, 1920. The cooperation of the United States government was assured through the Department of Agriculture and other departments, and the World's Dairy Congress was authorized by act of Congress of the United States of America, effective March 3, 1921. Invitations to the nations of the world to send delegates were issued by the President of the United States of America through its diplomatic representatives.

Prof. H. E. Van Norman, of the University of California, was the President of the Congress and made a trip to Europe to interest the foreign governments in the event. It had the cooperation of the International Dairy Federation, which has its headquarters at Brussels, Belgium, and also the backing of national and local dairy organizations in the United States.

The purpose of the Congress was to effect an international exchange of the newer knowledge of the sciences and practices of dairying and of the methods and results of a wise use of milk and its products in the human diet.

Its object was to bring together the forward-looking leaders who are shaping the trend of the dairy industry; to study the economic forces which influence domestic and international commerce in dairy animals and products and equipment; to discuss methods of disease prevention and of regulating and controlling the sanitation and standardization of dairy products; to consider the influence of a wise use of milk and its products on national health, and the vital importance of the part which they play in human physical and mental development.

The Congress had no authority to obligate the governments or organizations represented, although it was possible for them to make suggestions and recommendations as they might deem to be of interest to dairy science and the industry.

A special appropriation of \$30,000 by Congress, to the United States Department of Agriculture, rendered possible the print-

ing of the proceedings and the furnishing of all delegates with abstracts of the papers presented in either English, French, German or Spanish.

At the opening of the Congress in Washington there were eight hundred delegates present, and forty-five countries were represented. Three members of the President's Cabinet addressed the opening session: Charles Evans Hughes, Secretary of State; Herbert Hoover, Secretary of Commerce and President of the American Child Health Association; and Henry C. Wallace, Secretary of Agriculture. In the afternoon of the first day the delegates visited the White House and were received by President Coolidge, who delivered an address of welcome.

The Congress left Washington in special trains on October 3 and proceeded to Philadelphia, where they were addressed by Governor Pinchot, at a banquet at the Bellevue-Stratford Hotel. In Philadelphia a very interesting demonstration of the methods of teaching the value of proper diets in the schools was given under the direction of the Health Dramatics Department of the Philadelphia Interstate Dairy Council.

From Philadelphia the Congress moved in special trains to Syracuse, where the National Dairy Show was being held. Here they were addressed by the Governor of New York, Alfred E. Smith. A total of two hundred, thirty-six scientific papers was given by men from all parts of the world. In Syracuse five sessions of the Congress were being held in different assembly halls at the same time.

The Syracuse University held a convocation and conferred honorary degrees upon ten of the foreign delegates and President H. E. Van Norman.

The entertainment features and details of the Congress were carried out in an elaborate manner, and great credit should be given to President Van Norman and his assistants, particularly those in the United States Department of Agriculture, Bureau of Animal Industry, for the completeness of the arrangements.

The final session consisted of a banquet at Syracuse University, at which toasts were responded to by the foreign delegates and they expressed their great appreciation of the hospitality which had been shown them, and of the great progress of the dairy industry of the United States. There was a feeling among those present that the Congress had been a very great success and a material milestone in the progress of the world's dairy industry.

Of particular interest to veterinarians was the address, in Washington, at the combined session on international trade, by Dr. John R. Mohler, Chief of the Bureau of Animal Industry on "International Trade in Dairy Cattle." The paper covered the desirability of an exchange of information between nations at regular intervals in regard to:

(a) The diseases which exist in live-stock-producing countries, their prevalence, geographic location of infected areas, the efforts being made to control or eradicate them and the means employed.

(b) Prevalent internal and external parasites and the means employed to combat them.

(c) The facilities provided for research and investigations of animal diseases and the progress of the work.

(d) The livestock sanitary organizations established in the various countries, their policies, personnel, changes, etc.

The dangers which attend the movement of live stock between different sections of a country and between countries and the need for protecting the live stock industry against the dangers from moving animals for breeding or other purposes.

Live stock sanitary control through veterinary organizations provided with authority and funds to function effectually in regulating the movement of animals, and in promptly applying control and eradication measures in combating animal diseases as occasion requires.

The desirability of international regulations, which should be as uniform as possible, and suggestions in regard to fundamental provisions of regulations which would seem generally applicable to countries engaged in exporting and importing live stock for breeding and other purposes.

Doctor Mohler made it evident that those countries lacking proper live stock sanitary regulations and an efficient personnel to enforce regulations and gather information relative to the diseases prevalent within their borders cannot expect any longer to receive very much consideration in the acceptance of their export animals in countries which do have such organizations to prevent the importation of animal diseases into their territory.

At Syracuse, on October 10, a session of the Congress was devoted to diseases of dairy cattle, in which Sir Arnold Theiler was Honorary Chairman, and Dr. Louis A. Klein, of Philadelphia, was Chairman. The following papers were read by their authors at this session:

"Protozoan Diseases of Dairy Cattle," by Sir Arnold Theiler, Dean of the Veterinary Faculty, Transvaal University College, South Africa.

"Diseases of the Digestive System of Cattle," by Dr. D. H. Udall, In Charge Ambulatory Clinic, Cornell University.

"Bovine Mastitis," by Dr. F. S. Jones, Pathologist, Rockefeller Institute.

"Mastitis," by Dr. J. N. Frost, Professor of Surgery, N. Y. State Veterinary College, Cornell University.

"Bovine Tuberculosis Control," by Dr. V. A. Moore, Director and Dean, N. Y. State Veterinary College, Cornell University.

Papers were also listed on the program as follows, but the authors were not present, and, as time was pressing, they were not presented. They will, however, be published in the proceedings of the Congress:

"Investigation on the Pathology of Streptococcus Mastitis and on the Eventual Transmission of Mastitis through Milk-ing Machines," by O. Stenstrom, Professor of Pathological Anatomy, Royal Veterinary College, Sweden.

"Sterility in Dairy Cattle," by Dr. W. L. Boyd, Professor of Veterinary Medicine, University of Minnesota.

"The Present Status of our Knowledge of Abortion Disease," by Dr. C. P. Fitch, Chief, Division of Veterinary Medicine, University of Minnesota.

"Osteomalacia and Its Occurrence in Cattle in Norway," by Dr. Per Tuff, Professor of Anatomy and Animal Breeding, Agricultural College of Norway.

"The Control of the Foot and Mouth Disease in Europe," by Dr. Robert Ostertag, Counselor, Wurttemberg Ministry of the Interior, Germany.

Dr. Ch. Porcher, Chief, Department of Physics, Chemistry, Toxicology and Pharmacology, National Veterinary School, Lyons, France, whom, together with Sir Arnold Theiler, many veterinarians met at the Montreal meeting of the A. V. M. A., gave a paper at Session No. 15, covering the control of the quality of manufactured products, on "Cheese Nomenclature," and one at Session No. 21, covering milk secretion and the nutrition of dairy cows, on "The Physiology of the Udder."

Dr. S. Orla-Jensen, Professor, Veterinary Sciences and Bacteriology, Royal Agricultural and Veterinary College, Denmark,

presented a paper at Session No. 22, covering chemistry and bacteriology of milk, entitled "The Classification of Lactic Acid Bacteria." He again appeared on the program at Session No. 25, covering the control of the quality of milk, with a paper entitled "The Supply of Milk to Large Towns."

At Session No. 11, covering methods of improving and protecting the milk supply, papers were presented by Miss Alice Evans, Bacteriologist of the United States Public Health Service, on "The Relation of the Melitensis-Abortus Group of Organisms to Human Health;" by Dr. C. D. Pearce, Chief, Bureau Dairy Development and Chief Veterinarian, The Borden Company, on "Methods Employed within the Industry to Improve the Quality of Milk;" and by the writer on, "Health Department Organization in Developing a Municipal Pasteurized Milk Supply with a Final Bacterial Count under 15,000."

Sir Arnold Theiler, Dr. Ch. Porcher and Dr. Orla-Jensen were the foreign veterinarians attending the Congress. All three are authorities in their respective fields, and, at the Syracuse University Convocation, the honorary degree of Doctor of Science was conferred upon them.

A number of veterinarians not on the program attended the sessions in the several cities.

The variety of subjects presented by those appearing on the program is evidence of the diversified field for service by the veterinarian in this great industry. Space will not permit of further detail or even mention of many of the most interesting phases of work presented.]

It is extremely fortunate that money was made available by the Congress of the United States to publish the entire proceedings, which will be an authoritative treatise on practically every phase of the dairy industry and its fundamental bearing on human welfare.

GEO. H. HART.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. J. Elliott Crawford, in the Academy of Medicine, 17 West 43rd St., on Wednesday June 6, 1923, at 8:30 p. m. The minutes of the May meeting were read and approved. Dr.

W. Reid Blair reported a case of lameness in an elephant. (Report published in JOURNAL, September, 1923.)

Dr. R. H. Spaulding read a very interesting paper on "Pyometra in the Bitch." (Published in the JOURNAL, this issue.) Dr. Geo. W. Little reported similar cases and had used selective bacterins. Dr. R. W. Gannett reported a case that recovered by douching with sterile water. Dr. Koch reported several cases that recovered by douching.

Dr. Henry Amling reported a similar case that did not respond to treatment and on autopsy the ureters were found to empty directly into the uterus, causing a continued vaginal discharge. Dr. W. Reid Blair found many cases infected with *B. coli* and believed that removing the uterus is the most satisfactory treatment in many cases.

A number of cases in the horse were reported. Dr. McKinney related an interesting case in his hospital that did not respond to treatment. This horse had a skin wound on the hip that was very itchy and he asked for suggestions. "Seedy-toe" was discussed by Drs. Chase, Shaw, DeVine, McKinney and Clayton.

Dr. Cassius Way reported cases in cattle practice. He divided the diseases into three important groups: First, digestive disorders; second, udder troubles; third, breeding problems. He spoke at length on these subjects and brought out many important points in the care of cattle. The feeding of cattle must not be overlooked as well as the kind of food used. In udder troubles, cleanliness and the proper way of milking are important. In many cases of mastitis, infection has occurred through the teats.

Breeding troubles seemed to be important factors in herd management. The bulls must be healthy, should have proper exercise and food and while they may seem healthy they may not have fertile semen. The raising of calves is an important factor and a hard problem on breeding farms.

Dr. C. G. Rohrer reported having successfully removed five calculi from the bladder of a Pomeranian bitch, each calculus being the size of a large hickory nut and their combined weight being two ounces. He also reported several other cases of lithiasis in the dog.

Dr. W. Reid Blair, chairman of the special committee appointed to collect funds for a donation to the building committee of the Academy of Medicine reported having received \$88.00. On motion the committee was ordered discharged with thanks and the money turned over to the Treasurer.

It was regularly moved and seconded that the resignation of Dr. Alfred Oberle be accepted. President Crawford appointed the following delegates to the New York State meeting: Drs. Bruce Blair, C. S. Chase and W. Reid Blair. To the A. V. M. A.: Drs. J. F. DeVine, C. Way, C. S. Chase and W. Reid Blair. On motion a vote of thanks was extended the members for their contribution to the program. No other business appearing, the meeting adjourned.

C. G. ROHRER, *Secretary.*

BRITISH COLUMBIA VETERINARY ASSOCIATION

The annual meeting of the British Columbia Veterinary Association was held at New Westminster, October 6, 1923, with a goodly number of members in attendance.

Dr. E. A. Bruce, of Agassiz, gave a report of the recent A. V. M. A. meeting in Montreal. He also furnished interesting details in connection with the organization of the Canadian National Veterinary Association.

In the evening Dr. Kenneth Chester introduced the advertising manager of one of the leading agricultural journals, who addressed the members on the advantages of advertising. In opening the discussion Dr. Chester stated that the profession was not getting the recognition it deserved in the reading columns of the agricultural papers, owing to the fact that veterinarians did not patronize the advertising columns. It was considered very doubtful if the Association could advertise as a body, chiefly on account of the prohibitive costs; furthermore, there was a marked difference of opinion as to whether individual advertising was "quite the thing." It was eventually decided to submit the question to a vote of the members, and for this purpose the Secretary was instructed to send a questionnaire to the members.

Dr. Kenneth Chester, for many years Secretary and Registrar, tendered his resignation to the Association, on account of the pressure of other duties. This was accepted with considerable regret, as much of the success of the Association was attributed to his long and faithful service.

The following are the newly elected officers: President, Dr. T. R. Hoggan, Vancouver; Vice-President, Dr. Ottewell, Ladner; Secretary-Treasurer and Registrar, Dr. W. Graham Gillam, Cloverdale. The Board of Examiners was appointed as follows: Drs. McKenzie, McKay and Thompson.

W. GRAHAM GILLAM, *Secretary-Treasurer.*

EASTERN IOWA VETERINARY ASSOCIATION

The annual meeting of the Eastern Iowa Veterinary Association convened at the Montrose Hotel, Cedar Rapids, Iowa., October 10-11, 1923, President C. M. Morgan, of Manchester, Iowa, presiding. There were about one hundred veterinarians in attendance. The Association was welcomed to Cedar Rapids by the Mayor and the response was delivered by Dr. M. E. Dickens, of Washington, Iowa.

The morning session of the first day was devoted to poultry practice and the following papers were presented: "The Veterinarian and Poultry Practice," by Dr. John Patterson, Hedrick, Iowa; "Chicken Disorders," by Dr. H. J. Fry, of Kalona, Iowa; "Chicken Diseases," by Dr. C. H. Smith, of Jesup, Iowa; and "Developing a Poultry Practice," by Dr. F. M. Maxfield, of Tama, Iowa.

At the evening session, Dr. D. A. Eastman, of Cedar Rapids, Iowa, presented the subject of "Small Animal Practice." "Tuberculosis Eradication" was discussed by Dr. Peter Malcolm, State Veterinarian, of Des Moines, "Infectious Abortion" was presented by Dr. Ashe Lockhart, of Kansas City. "Vaccination Complications" was the subject chosen by Dr. J. G. Schrader, of Oxford, Iowa. Dr. A. H. Quin, Jr., of Fort Dodge, Iowa, discussed "Swine Problems."

Wednesday evening a banquet was served, attended by the veterinarians and ladies. The banquet was followed by an entertainment and a dance.

The Thursday morning program was opened by Dr. E. R. Steel, of Grundy Center, Iowa, who discussed "Matters of Importance to Iowa Veterinarians." Dr. Henry Hell, of Wilton, Iowa, spoke on "Veterinary Publicity." Under the title of "What Happened at Montreal," Dr. C. H. Stange, President of the American Veterinary Medical Association, gave a report of the meeting recently held in Montreal. The subject of "Milk Inspection" was presented by Drs. A. R. Menary and A. M. Casper, of Cedar Rapids, Iowa.

Thursday evening a clinic was held at the hospital of Dr. Griffith and the following operations were performed: Dr. George Aulbury, of Monticello, Iowa, demonstrated a new method of spaying a bitch. Dr. H. E. Bemis, of Ames, Iowa, performed a radical operation for poll evil. Dr. Jerry Wolfe, of Grand Mound, Iowa, demonstrated the removal of a scirrhus

cord in a pig. Dr. John Patterson, of Hedrick, Iowa, gave a demonstration of caponizing. Dr. N. W. Ackerman, of Center Junction, Iowa, performed a cesarean section in a sow.

An election of officers resulted as follows: President, Dr. J. H. Odgers, De Witt, Iowa; Vice-President, Dr. J. C. McCabe, West Liberty, Iowa; Secretary-Treasurer, Dr. F. J. Crow, Iowa City, Iowa.

FRED J. CROW, *Sec.-Treas.*

PROPHYLACTIC CLUB OF AMERICA

The Prophylactic Club of America, composed largely of Connecticut veterinarians, held its fourth annual conference at Bantam Lake, Litchfield County, Conn., October 20-21, 1923. The meeting was held at the home of Commissioner J. M. Whittlesey, who was host. All conditions were perfect, and the meeting will pass into recollections as the best ever held and all present were well satisfied with the plans proposed for the union of forces, as represented by the Connecticut veterinarians and the Federal and State Departments.

Dr. A. E. Wight, of Washington, D. C., was the principal speaker. Of the seventy-five in attendance, over forty were veterinarians from Connecticut and adjoining states. New officers elected were: President, Dr. R. S. Todd, of New Milford; Secretary, Dr. G. E. Corwin, of Hartford; Orator, Dr. Thomas Bland, of Waterbury. Commissioner T. E. Robinson and his aide, Dr. J. M. Armstrong, of Rhode Island, were among those in attendance.

B. D. P.

MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION

The eighteenth annual meeting of the Mississippi State Veterinary Medical Association was held in the directors' room, Grenada Bank Building, Grenada, Miss., October 24-25, 1923. The usual time for this Association to meet is in January, but owing to the fact that the North Mississippi Fair is held at Grenada, in October, a vote was taken which resulted in the almost unanimous consent to hold the meeting at this time, instead of January, 1924.

The meeting was called to order by the President, Dr. I. W. Edwards, of Vicksburg. The address of welcome was made by Hon. W. S. P. Doty, Grenada, Miss. In the absence of Dr. Tait

Butler, the response was made by Dr. D. F. Luckey, of St. Louis. Being next on the program, Dr. R. M. Staley, with the H. K. Mulford Co., of Philadelphia, Pa., gave a very interesting and instructive lecture on various anthrax vaccines, bovine abortion and rabies. The Association showed that it was interested in these subjects by thoroughly discussing each one. Drs. Quitman and Cary not being present, the meeting adjourned in order to give the members and visitors an opportunity to take in the polo games, horse races, and other attractions at the fair.

The business meeting was held at 6 p. m., followed by a talk on "Sheep Diseases," by Dr. D. F. Luckey, of St. Louis, which was thoroughly enjoyed by every one present. Dr. W. O. Hughes, of West Point, Miss., and Dr. J. V. Duckworth, of Hazlehurst, Miss., were proposed and accepted as new members in the Association. The banquet was held at the Grenada Hotel, at 9 p. m. This feature of the evening program was enjoyed by about fifty persons, including a number of ladies. Mr. Hoffa, owner of the Cotton States Anti-Hog Cholera Serum Plant, acted as toastmaster.

The address on "Current Therapeutics," by Dr. E. L. Quitman, of Chicago, was the first and only address of the Thursday morning session, which was followed by a lively discussion. Dr. C. E. Salsbery, of Kansas City, could not be present, and time would not permit the presentation of papers prepared by Drs. Hudson Chadwick, of Jackson, Miss., and W. O. Hughes, of West Point, Miss. Following Dr. Quitman's address, the members and visitors were conveyed to the Cotton States Anti-Hog Cholera Serum Plant in cars provided by the local committee, where Dr. J. S. Clark, B. A. I. Inspector in Charge, explained in detail the production of serum and virus.

From the serum plant Dr. Ferguson led the way to the Glenwild plantation, owned by Mr. Borden, of Chicago. Here the members of the Association were shown the spacious administration buildings and modern cattle barn used to house purebred Herefords and Shorthorns; also the horse barn modernly equipped and situated near the old colonial home, which has been converted into a modern residence by Mr. Borden.

Election of officers resulted as follows: President, Dr. W. P. Ferguson, Grenada, Miss.; 1st Vice-President, Dr. R. H. Mohlenhoff, Cleveland, Miss.; 2nd Vice-President, Dr. B. M. Daven-

port, Scott, Miss.; Secretary-Treasurer, Dr. C. G. Stalworth, Drew, Miss.

The next regular meeting of the Association will be held at Greenville, Miss., some time during the month of January, 1925.

H. L. FRY, *Secretary-Treasurer*.

MICHIGAN-OHIO VETERINARY ASSOCIATION

The annual meeting of the Michigan-Ohio Veterinary Association convened at the hospital of Dr. J. H. Lenfesty, Lyons, Ohio, Wednesday, October 31, 1923. The meeting was called to order by the President, Dr. A. J. Kline, of Wauseon, Ohio. About fifty veterinarians from Michigan and Ohio were in attendance.

The program was opened by Dr. J. H. Lenfesty, who demonstrated the Ferguson operation, for the relief of obstructed teat canal. Dr. Lenfesty stated that this operation was proving to be highly satisfactory in his hands.

Dr. H. J. Stafseth, Poultry Pathologist of the Michigan Agricultural College, held autopsies on two fowls that had been presented for the clinic. He followed with an address entitled "Poultry Sanitation and Hygiene." Dr. Stafseth gave many valuable pointers in connection with the successful handling of poultry.

Dr. Alvin Broerman, Bacteriologist of the Ohio Department of Agriculture, presented a very fine paper entitled, "The Common Diseases of Poultry." Then followed a very profitable discussion on various phases of poultry practice, and many of the veterinarians present volunteered suggestions with reference to handling various poultry diseases.

Dr. F. A. Zimmer, State Veterinarian of Ohio, addressed the meeting on the subject of "Practice of Veterinary Medicine near State Borders." Dr. Zimmer related numerous difficulties in connection with the control of animal diseases, particularly in connection with tuberculosis and tuberculin testing, in parts of the State immediately bordering on the five states which adjoin Ohio. He stated that many of these difficulties could be very much simplified if the local veterinarians were registered to practice in both states and although this was not absolutely essential, it would be of advantage both to the veterinarian and his clients. The subject was discussed by Dr. B. J. Killham, State Veterinarian of Michigan; Dr. Reuben Hilty, of Toledo, Ohio; Dr. C. W. Fogle, President of the Ohio State Veterinary Medical

Association, Dr. Paul Vaughn, Bureau of Animal Industry, inspector in charge of tuberculosis eradication in Ohio; and Dr. George Smith, of Toledo, Ohio.

Dr. C. W. Fogle then addressed the meeting on "Vaccination Don'ts." In his address Dr. Fogle gave the members the benefit of his very extensive experience in controlling hog cholera. A very animated discussion followed, which was lead by Dr. H. M. Newton, Bureau of Animal Industry, inspector in charge of hog cholera control in Michigan.

SOUTHEASTERN STATES VETERINARY MEDICAL ASSOCIATION

The eighth annual meeting of the Southeastern States Veterinary Medical Association was held at the O. Henry Hotel, Greensboro, N. C., November 12-13, 1923. The meeting was called to order by President M. Jacob, of Knoxville, Tenn. The Association was welcomed to Greensboro by Mr. C. W. Roberts, Secretary of the Greensboro Chamber of Commerce. The response was delivered by Dr. J. G. Ferneyhough, State Veterinarian of Virginia, who took advantage of the opportunity to invite the Association to hold the 1924 meeting in Richmond, Va.

In his presidential address Dr. Jacob referred to the period of readjustment which the veterinary profession has been passing through the past few years and expressed the belief that it is now realized that successful agriculture and health must depend very largely upon modern veterinary service.

"These agencies have at various times imposed some very difficult problems on this profession which have always been met and carried to a successful conclusion," Dr. Jacob said. "It is true that the veterinarian's remuneration is usually far below that of other professions, yet we must not at this time permit any backward step in our educational standards, but on the contrary, strive for those things which tend toward greater efficiency. Any other progress would mean retrogress instead of progress."

The literary program was opened with the reading of a splendid paper by Dr. A. G. G. Richardson, of Atlanta, Ga. The author reviewed conditions in the profession in the past, enumerating the various problems which are facing veterinarians at the present time, and made predictions for the future. Dr. Richardson is strictly of the opinion that the difficulties of the present

and future will be overcome just as readily as they have been in the past.

Dr. R. H. Parker, of Gastonia, N. C., read an extremely well prepared paper dealing with "Unusual Cases in General Practice." This paper will be published in the JOURNAL.

The afternoon session was opened with an address by Dr. Cassius Way, of New York City, entitled, "The Relation of the Veterinarian to Breeding Problems and Breeding Efficiency." Dr. Way reviewed in an intensely practical manner the various factors which combine to render animals efficient from the breeding standpoint. He stated that herd hygiene must be carefully observed at all times and nothing left undone that will promote and maintain the health of the animals in the herd, both individually and collectively. He covered in detail such subjects as maternity stalls, douching the bull, endocrine disturbances, cervicitis and allied conditions. Dr. Way demonstrated his favorite method of examining the cervix, using the Hopper forceps. Dietetics and digestive disorders in highly bred calves were thoroughly discussed. He also referred to cases of fat indigestion in calves, resulting in scours. Every one present felt that Dr. Way's address was intensely practical and of great value to the practitioners who were located in dairy and breeding districts.

Dr. C. A. Cary announced the subject of his address as "Two Failures." He then related two case reports, both of which were somewhat out of the ordinary. The first was the case of a bitch suffering from fibroids and a cystic ovary. Dr. Cary undertook to remove the fibroids by a very neat operation; the latter was successful, but the patient died while under the anesthetic. The condition of cystic ovary was revealed at autopsy. The other case was in a horse, upon which he had performed a nerving operation. This was followed by the formation of neuromas. Later this case was complicated by breaking down of the deep perforans tendon. Autopsy revealed a double fracture of the navicular bone.

The subject of "Fowl Typhoid" was presented by Dr. B. F. Kaupp, poultry pathologist, of Raleigh, N. C. This paper will be published in the JOURNAL. A short business session was then held and the advisability of incorporating the Association was thoroughly discussed. The Secretary was authorized to proceed with such incorporation in whatever state seemed most desirable. Fourteen new members were admitted to membership. Members

of the Greensboro Chamber of Commerce then took the visiting veterinarians for an automobile tour of the city.

Monday evening a banquet was served, followed by two addresses, Mr. Charles W. Gold, Treasurer of the Jefferson Standard Life Insurance Company and a member of the Governing Board of the North Carolina Agricultural College, spoke on the value of competent veterinary services to the live stock industry of the State. He then told those present of the strides which North Carolina was making, both agriculturally and industrially.

The other address, scheduled to be given by Dr. C. H. Stange, President of the American Veterinary Medical Association, was delivered by Dr. H. P. Hoskins, Secretary-Editor. Dr. Stange was unable to be present on account of the recent death of his father. Dr. Hoskins briefly reviewed the steps leading up to the consolidation of the offices of Secretary and Editor of the A. V. M. A. and related what had been accomplished during the past year. He spoke at length relative to the JOURNAL and its value to all members, regardless of the particular field in which they were engaged.

Dr. Hoskins announced that very shortly an executive board election would be held in District No. 4, a territory which embraces practically the same states which are represented in the Southeastern Association. He also called attention to the fact that in this district the number of members was somewhat below the average for the other districts, although a number of them were considerably smaller geographically. He closed by proposing a toast to Dr. Benjamin McInnes, of Charleston, S. C., who was present, and who has been a member of the A. V. M. A. for forty-seven years, and who now enjoys the distinction of being one of the three oldest members in the Association.

The Tuesday morning session was opened with an address by Dr. W. J. Lentz, of Philadelphia, Pa., on "Some Phases of Small Animal Practice." Dr. Lentz is Director of the Small Animal Clinic at the University of Pennsylvania, and has had an unusual opportunity to study animal diseases and their treatment. In his address he paid particular attention to distemper. It is the opinion of Dr. Lentz that there are at least four pathological conditions which clinically simulate distemper and which call for differentiation by the veterinarian, if they are to be treated most successfully. Dr. Lentz stressed the importance of paying more attention to dietetics in the treatment of distemper and

outlined various forms of medicinal treatment which had proved most satisfactory in his hands. Dr. Lentz stated that biologics for the treatment of canine distemper had been complete failures in his experience.

Dr. Lewis Taylor, of High Point, N. C., in a splendid paper paid a wonderful tribute to the work of Pasteur. Dr. Taylor reviewed a number of Pasteur's contributions to medical science and brought out the point that these were all the more remarkable in view of the fact that Pasteur had been neither a physician nor a veterinarian.

Dr. Wm. Moore, State Veterinarian of North Carolina, read a paper entitled, "Some Legal Phases of Veterinary Practice." Besides being well posted on veterinary medicine, Dr. Moore is well read in the law and this combination enabled him to treat his subject unusually well. He dwelt especially upon the obligations of the practicing veterinarian, with particular reference to his clients and patients. "Current Education of the Practitioner" was the subject of a well prepared paper by Dr. W. K. Lewis, State Veterinarian of South Carolina. This paper will be published in the JOURNAL.

Dr. A. L. Hirleman, Bureau of Animal Industry, inspector in charge of tuberculosis eradication, in Georgia, related "Experiences in Tuberculosis Eradication in Badly Infected Herds." Dr. Hirleman illustrated his subject with a number of charts. In one case he showed how difficult it had been to clean up a very valuable pure-bred herd. Although all three tests were used both singly and in combination, it seemed just about impossible to clean up this herd, as every retest revealed reactors. The reason for this difficulty was revealed by information subsequently obtained relative to the past history of this herd. It was ascertained that the owner had been in the habit of applying a subcutaneous tuberculin test about every three months, the result being that the animals in the herd were "plugged" and failed to react when subsequently tested by the Bureau of Animal Industry veterinarians.

In another case, Dr. Hirleman offered evidence to show that cows were continually being infected through the agency of a stream of water running through a pasture where the herd was kept. He believed that other sources of infection had been eliminated, in a study of the conditions surrounding this particular herd.

Officers for the year were elected as follows: President, Dr.

A. L. Hirleman, of Atlanta, Ga.; 1st Vice-President, Dr. R. H. Parker, of Gastonia, N. C.; 2nd Vice-President, Dr. J. G. Ferneyhough, of Richmond, Va.; 3rd Vice-President, Dr. J. I. Neil, of Snaford, N. C.; Secretary-Treasurer, Dr. J. I. Handley, of Atlanta, Ga. It was agreed to hold the 1924 meeting in Richmond, Va.

Members of the Association were unanimous in their praise for the efforts of Dr. Handley, in arranging the splendid program for the meeting and for the improved financial condition of the Association, as shown by the annual report.

The Schuylkill Valley Veterinary Association held its regular October meeting on a farm two miles south of Reading, Pa., where a large number of the very finest silver black foxes are being produced.

STATE LIVE STOCK SANITARY OFFICIALS NOVEMBER 15, 1923.

- Alabama—Dr. C. A. Cary, State Veterinarian, Live Stock Sanitary Department, Auburn.
- Arizona—Dr. S. E. Douglas, State Veterinarian, Phoenix.
- Arkansas—Dr. Joe H. Bux, State Veterinarian, Little Rock.
- California—Dr. J. P. Iverson, State Veterinarian, Sacramento.
- Colorado—Dr. C. G. Lamb, State Veterinarian, State Board of Stock Inspection Commissioners, Denver.
- Connecticut—Hon. J. M. Whittlesey, Commissioner of Domestic Animals, Hartford.
- Delaware—Hon. Wesley Webb, Secretary, State Board of Agriculture, Dover.
- Florida—Dr. J. V. Knapp, State Veterinarian, State Live Stock Sanitary Board, Tallahassee.
- Georgia—Dr. Peter F. Bahnsen, State Veterinarian, Bureau of Live Stock Industry, Atlanta.
- Idaho—Dr. Wendell R. Smith, Director, Bureau of Animal Industry, Boise.
- Illinois—Dr. F. A. Laird, Chief Veterinarian, Division of Animal Industry, Springfield.
- Indiana—Dr. R. C. Julien, State Veterinarian, Indianapolis.
- Iowa—Dr. Peter Malcolm, State Veterinarian, Commission of Animal Health, Des Moines.
- Kansas—Hon. J. H. Mercer, Commissioner, Topeka.
- Kentucky—Dr. W. H. Simmons, State Veterinarian, State Live Stock Sanitary Board, Frankfort.
- Louisiana—Dr. E. P. Flower, Secretary and Executive Officer, State Live Stock Sanitary Board, Baton Rouge.
- Maine—Hon. Herbert M. Tucker, Chief, Division of Animal Industry, Augusta.

Maryland—Hon. J. B. George, Chief, Department of Animal Industry, 816 Fidelity Bldg., Baltimore.

Massachusetts—Dr. L. H. Howard, Director, Division of Animal Industry, Boston.

Michigan—Dr. B. J. Killham, Chief Veterinarian, Bureau of Animal Industry, Lansing.

Minnesota—Dr. C. E. Cotton, Secretary and Executive Officer, State Live Stock Sanitary Board, St. Paul.

Mississippi—Dr. K. U. Jones, State Veterinarian, State Live Stock Sanitary Board, Agricultural College.

Missouri—Dr. H. A. Wilson, State Veterinarian, Board of Agriculture, Jefferson City.

Montana—Dr. W. J. Butler, State Veterinary Surgeon, Live Stock Sanitary Board, Helena.

Nebraska—Dr. L. R. Cantwell, State Veterinarian, Lincoln.

Nevada—Dr. Edward Records, State Quarantine Officer, State Board of Stock Commissioners, Reno.

New Hampshire—Hon. A. L. Felker, Commissioner of Agriculture, Concord.

New Jersey—Dr. J. H. McNeil, Chief, Bureau of Animal Industry, Trenton.

New Mexico—Hon. Matt Keenan, Secretary, Cattle Sanitary Board, Albuquerque.—Hon. John Robertson, Secretary, Sheep Sanitary Board, Albuquerque.

New York—Hon. H. J. Henry, Director of Bureau of Animal Industry, Albany.

North Carolina—Dr. Wm. Moore, State Veterinarian, Raleigh.

North Dakota—Dr. W. F. Crewe, State Veterinarian, State Live Stock Sanitary Board, Bismarck.

Ohio—Dr. F. A. Zimmer, Chief Veterinarian, Division of Animal Industry, Columbus.

Oklahoma—Dr. E. V. Robnett, State Veterinarian, Oklahoma City.

Oregon—Dr. W. H. Lytle, State Veterinarian, State Live Stock Sanitary Board, Salem.

Pennsylvania—Dr. T. E. Munce, State Veterinarian, Bureau of Animal Industry, Harrisburg.

Rhode Island—Dr. Thos. E. Robinson, State Veterinarian, Providence.

South Carolina—Dr. W. K. Lewis, State Veterinarian, Columbia.

South Dakota—Dr. J. E. Phelps, State Veterinarian, Live Stock Sanitary Board, Pierre.

Tennessee—Dr. W. B. Lincoln, State Veterinarian, Department of Agriculture, Nashville.

Texas—Dr. Leon G. Cloud, State Veterinarian, Live Stock Sanitary Commission, Fort Worth.

Utah—Dr. A. J. Webb, State Veterinarian, State Board of Agriculture, Salt Lake City.

Vermont—Hon. E. S. Brigham, Commissioner of Agriculture, Montpelier.

Virginia—Dr. J. G. Fernyhough, State Veterinarian, State Live Stock Sanitary Board, Richmond.

Washington—Hon. E. L. French, Director, Department of Agriculture, Olympia.

West Virginia—Hon. J. H. Stewart, Commissioner of Agriculture, Charleston.

Wisconsin—Dr. V. S. Larson, State Veterinarian, Madison.

Wyoming—Dr. A. W. French, State Veterinarian, Cheyenne.

LEGISLATION AFFECTING VETERINARIANS YEAR 1923

ALABAMA:

Appropriated \$5,000 per annum for tuberculosis work.

ARIZONA:

A law was passed creating a State Board of Veterinary Medical Examiners and prescribing regulations for the practice of veterinary medicine and surgery in the State of Arizona.

A law was passed requiring that all dairy cattle shipped into the State of Arizona be retested for tuberculosis within a period of sixty days. The State made an appropriation of \$50,000 a year for two years, to be matched by a like amount from the Federal Government, for the eradication of tuberculosis among dairy cattle, under a cooperative plan.

An emergency appropriation of \$10,000 was made for continuing the work on tuberculosis eradication, begun in August, 1922, this appropriation to cover the period of four months (March to June) intervening until July 1, when the new appropriation became available.

ARKANSAS:

No live stock sanitary control measures passed, although the Legislature granted the right to practice to eight non-graduates in the State.

State veterinarian intends to assign one veterinary inspector to tuberculosis eradication work.

CALIFORNIA:

Bill passed both houses providing that counties could pay indemnity, but it was vetoed by the Governor, who also failed to sign a new veterinary practice act, providing for a higher license fee and an annual registration fee of \$2.00, and containing a clause that would give one-half of all fines collected to the Board for a revolving fund to be used in prosecutions.

COLORADO:

An attempt was made to abolish the State Board of Veterinary Medical Examiners, and thereby throw the State of Colorado wide open to anyone who wished to engage in the practice of veterinary medicine. The proposed bill was killed in committee.

A law was enacted authorizing cooperative work with the Federal Government, as well as with municipalities and counties. It provides for the establishment of tuberculosis eradication areas, and carries with it an appropriation of \$16,000, which is just double the amount of the former appropriation.

CONNECTICUT:

A measure was introduced into the Legislature providing that the Commissioner of Domestic Animals, at the request of the owner, employ a veterinarian at a fixed fee, to be paid by the owner, to make the accredited-herd test. This bill was reported unfavorably by the Committee on Agriculture and failed to pass.

The Legislature appropriated \$100,000 per year for two years for indemnity. Also \$15,000 as an emergency appropriation for the remainder of fiscal year.

DELAWARE:

The Legislature passed a law appropriating \$5,000 for the purchase of anti-hog cholera serum, same to be distributed free to qualified veterinarians, for the control of outbreaks of hog cholera. An appropriation of \$1,500 was made for the investigation and control of poultry diseases. This has been placed at the disposal of the Department of Animal Industry of the University of Delaware. An appropriation of \$50,000 was made for tuberculosis eradication for the year beginning July 1, 1923, and \$38,500 for the year following. These appropriations cover indemnities and operating expenses.

FLORIDA:

A bill was passed creating a State Live Stock Sanitary Board, and making the same a body corporate, prescribing the powers and duties of said Board,

as well as the qualifications of the members thereof, their compensation and term of office, and providing for the giving of bonds for the faithful performance of the duties of their office, providing for the employment of a State veterinarian and prescribing his duties, term of office, compensation and bond, providing for the division of the State of Florida into the quarantine areas and zones, prescribing the method and manner of tick eradication work in the State of Florida, etc.

A veterinary practice act was introduced and reached third reading in the House of Representatives, and, although there was no opposition to the bill, it failed to be passed, through not being reached on account of a congested calendar.

A law was passed providing for the purchase of anti-hog cholera serum and virus, to be used in the suppression of hog cholera in the State of Florida. The law provides that the State Live Stock Sanitary Board advertise for bids, and purchase under contract from the lowest and best bidder, the quality of the products being the paramount issue. The serum and virus are to be distributed at cost. A clause in the bill provides that each hog owner may obtain, free of cost, an amount not to exceed fifty per cent of the first 1,500 cc ordered. An annual appropriation of \$15,000 was made for carrying out the provision of this act.

The Legislature appropriated \$6,300 per year for two years for operating expenses, and also \$6,000 per year for two years for indemnity in connection with tuberculosis eradication work.

GEORGIA:

Legislature not in session.

IDAHO:

The Legislature appropriated \$10,000 for indemnity for two years. Also passed bill levying a one-mill tax on cattle valuation, which will raise \$12,000. Passed a bill limiting the appraisal to the assessed value, also prohibiting payment on cattle which have been in the State less than 120 days. Passed a bill permitting counties to make appropriations for tuberculosis work and providing for enforcement of quarantine in free areas.

ILLINOIS:

A law was passed, which became effective September 1, 1923, requiring all manufacturers and distributors of anti-hog cholera serum to obtain a license from the Bureau of Animal Industry, before being allowed to handle or sell said products within the State of Illinois.

Appropriated \$1,000,000 for the next biennium. This will allow \$50,000 per year for operating expenses and \$450,000 per year for indemnity. Passed a law providing that counties may appropriate funds. Also provided that State may pay all indemnity when Federal funds are exhausted.

INDIANA:

Appropriated \$100,000 per year for indemnity and \$40,000 per year for operation in connection with tuberculosis eradication work.

IOWA:

A bill was passed creating a Department of Agriculture and providing for the consolidation thereunder of a number of departments, including the Commission of Animal Health, the State Veterinary Department, the Dairy and Food Department, and several other minor departments pertaining to agriculture. This law went into effect July 1, 1923.

Another law was passed amending previous acts, so as to permit the establishment of additional methods for the eradication of bovine tuberculosis and thereby promote the health and welfare of the citizens of the State. Under this law the county area plan, as well as the county accredited area plan, are provided for.

Another law provided for reducing the indemnity for tuberculous cattle, the valuation of pure-breds being reduced from \$80 to \$50 and that of grades from \$40 to \$25.

The sum of \$250,000 per annum was appropriated for tuberculosis eradication work for two years.

KANSAS:

During the annual meeting of the Kansas Veterinary Medical Association, held in Topeka, on January 17 and 18, 1923, resolutions were passed requesting the legislative committee of the Association to employ legal advice and prepare to introduce legislative measures which should place the animal disease control activities under the direction of a live stock sanitary board with a State veterinarian in charge of the work.

This would have replaced the present Kansas Live Stock Commissioner's office, and resulted in the substituting of a veterinarian for a layman to administer the affairs of that office.

The Association pledged one hundred per cent support to the legislative committee in their efforts, and a special assessment of \$5.00 per member was made to support the cause financially. The law which is on the statute books was quite an obstacle to overcome, and considerable opposition was encountered. Propaganda was sent broadcast to breeders of pure-bred live stock in the State, and many breeders became interested in the bill and appeared before a legislative committee hearing, accompanied by about one hundred veterinarians. The bill, however, was defeated in committee.

Another attempt will probably be made at the next session of the Legislature, since there is considerable sentiment among the breeders to have a veterinarian in charge of animal disease control work in Kansas.

The Legislature made an appropriation of \$30,000 for all live stock sanitary work for the next biennium.

KENTUCKY:

An attempt was made in the recent session of the Legislature to amend the law, and thereby remove the license from serum manufacturers and allow them to distribute their products in the State without paying a license fee. This measure failed to pass.

Appropriated \$35,500 for all animal disease work for the fiscal year ending June 30, 1923; also same amount for fiscal year ending June 30, 1924. About \$30,000 per year of this will be used for tuberculosis eradication work. The indemnity funds are unlimited, as they come direct from the general fund.

LOUISIANA:

Legislature not in session during 1923.

MAINE:

A law was passed providing that all applicants for a license to practice veterinary science in the State must first pass an examination. An annual registration fee of \$1.00 was also provided.

Appropriated \$65,000 per year for two years, \$6,000 being for operation and \$59,000 for indemnity.

MARYLAND:

Legislature not in session.

MASSACHUSETTS:

Appropriated \$100,000 for indemnity for tuberculous cattle, for one year. Appropriation for operation comes out of general fund.

MICHIGAN:

A law was passed providing that the owner of a tuberculous animal shall receive one-half of the appraised value, not to exceed \$30 for a grade animal or \$60 for a pure-bred, registered animal. The right is given to county supervisors to appropriate funds for tuberculosis work.

Another bill was passed providing an appropriation of \$250,000 for each of the next two fiscal years, to be used in paying indemnities for tuberculous cattle.

An amount of \$76,000 for each of the next two fiscal years was appropriated for the operating expenses of the Bureau of Animal Industry.

An amendment to the sheep-dipping law was made, providing that sheep intended for breeding purposes and shipped into the State during the period between August 31 and May 1 should not be subjected to the provisions of the act. In view of the fact that most of the sheep shipped into Michigan are feeders, and that the vast majority of these arrive in the State during

the period specified in the law, the amendment practically nullifies the sheep-dipping law.

An attempt was made to secure the passage of a farmer vaccination bill, modeled very closely after the Iowa statute. The measure was opposed by the State Bureau of Animal Industry, a number of the leading swine producers in the State, as well as the veterinary profession. The bill had some rather influential backing, and it was reported out favorably by the Agricultural Committee of the House, only to be lost when it came to a vote on the floor of the House.

MINNESOTA:

A law was enacted permitting farmers to vaccinate their own hogs. Although this bill, as introduced, was an exact copy of the Iowa statute, several constructive amendments to the bill were made. Under the law no permits are granted in a county unless it has been officially pronounced as infected with hog cholera by the State Live Stock Sanitary Board, or unless at least five outbreaks of hog cholera have occurred in the county, been diagnosed and officially reported as such by qualified licensed veterinarians.

Another amendment to the bill changed the punishment for receiving rebates from serum companies, from revocation of license to a misdemeanor only.

Another bill provides for the area plan of control of tuberculosis. Counties may levy 25 cents per head on cattle, to provide funds for carrying on "area" work.

A law was also passed whereby indemnity will not be paid for an animal unless it is one year of age and unless it has been slaughtered within one hundred and fifty days from the date of its condemnation, nor will indemnity be paid if the owner has been feeding milk or milk products derived from creameries that do not pasteurize, as is required by the State law.

The Legislature appropriated \$40,000 for salaries, \$15,000 for contingent and overhead, and \$200,000 annually for general indemnity purposes. An additional appropriation of \$75,000 was made for indemnities, to be immediately available for payment of accrued claims, for the then present fiscal year, and \$100,000 annually for indemnities for tuberculous cattle killed under the area plan of control in counties.

Total appropriations for the next two years for tuberculosis eradication work amount to \$710,000.

MISSISSIPPI:

Legislature not in session.

MISSOURI:

A measure was introduced but failed of passage, providing for the amending of the veterinary practice act, so as to make it lawful for any person to perform operations of castrating, dehorning, spaying, and vaccinating against hog cholera and blackleg.

The Legislature appropriated \$100,000 for operating expenses and \$50,000 for indemnity for 1923 and 1924, or \$50,000 per year for operation and \$25,000 per year for indemnity. The counties pay the same amount of indemnity as the State, therefore, the sum of \$50,000 a year is available for indemnity. A bill was passed so that no indemnity is paid on cattle imported into the State unless they have passed a retest made not less than 90 days after arrival.

MONTANA:

By mutual agreement between the Live Stock Sanitary Board and the State Department of Agriculture, the State Department of Agriculture law was amended so as to provide them with authority to inspect creameries, receiving stations and ice cream factories; also for the law to provide regulations governing the standards of butter and ice cream. The previous law provided that the Live Stock Sanitary Board should have control of all of this work and the chemical analysis of these dairy products, which interfered very greatly with the work of the chemical laboratory in making chemical analyses of live stock feeds and matters pertaining to live stock sanitation.

The Live Stock Sanitary Board maintains its control over dairies and milk plants and standards governing the production and sale of milk and cream,

as well as its control over tuberculin testing of all cattle, and other work pertaining to live stock sanitary control.

About \$25,000 per year will be set aside for indemnity. The Legislature appropriated about \$108,000 for Live Stock Sanitary Board for the current year, and the same amount for next year.

NEBRASKA:

A law was enacted providing for tuberculosis eradication, under the county area plan.

Another measure which became a law, amended the existing statute, which provided for the collection of fees to be charged for inspections for the eradication of tuberculosis. Under the provisions of this act, the fee for testing animals other than those under State and Federal supervision shall be \$1.00 per animal for the first five animals, and at the rate of 50 cents per head for the next twenty animals, and at the rate of 25 cents per head for every animal in excess of twenty-five head, to be paid by the owner to the Department of Agriculture or its agent at the time the test is made. These fees may be allowed by the Department of Agriculture to the authorized agent performing the tests, such fees to be in lieu of salary or other emolument therefor.

The sum of \$285,000 was appropriated, for the two-year period, for the purpose of eradicating bovine tuberculosis, under the supervision of the Department of Agriculture.

Passed bill outlining plan for area work. Reduced indemnity to maximum of \$30.00 for pure-breeds and \$15.00 for grade cattle.

NEVADA:

An amendment to the general quarantine laws of the State was passed, which gives the State Quarantine Officer definite authority to appoint deputies for the inspection of agricultural commodities under quarantine by other States offered for shipment to same. Under a strict interpretation of the law, live stock is classed as such a commodity, and, therefore, the amendment may be applied in the case of veterinarians inspecting live stock destined for interstate shipment, if necessary.

From a fund raised by a special levy on live stock, \$5,000 per year is set aside for indemnity and \$5,000 per year for operation.

NEW HAMPSHIRE:

There was an attempt made to amend the veterinary practice act, whereby non-graduates would be authorized to use the titles "Doctor" or "Veterinary Surgeon" in connection with their names, instead of the word "Licensed Veterinarian." The measure failed to pass.

The Legislature appropriated \$100,000 per year for two years, \$85,000 being for indemnity and \$15,000 for operation. Also, \$35,000 emergency for remainder of fiscal year.

NEW JERSEY:

The sum of \$100,000 was appropriated for tuberculosis eradication work.

NEW MEXICO:

Legislature appropriated \$5,000 for indemnity for one year.

NEW YORK:

Two bills were introduced during the legislative session, neither of which was reported favorably from the Public Health Committee. One bill provided for eliminating the New York licensing requirement, now in effect, and the other provided for permitting veterinarians to register without examination, upon certificate of two veterinarians.

The Legislature appropriated \$2,500,000 to pay accrued indemnity claims, also the same amount (\$2,500,000) for tuberculosis indemnity during the year beginning July 1, 1923, \$300,000 to be immediately available.

NORTH CAROLINA:

Two measures were introduced providing for licensing non-graduates, but these died in committee and never reached the floor of the general assembly.

The Legislature appropriated \$20,000 per year for indemnity for two years. This is four times as much as has been appropriated heretofore.

NORTH DAKOTA:

Legislature appropriated \$95,000 for tuberculosis work for two years. This will allow \$25,000 per year for operating expenses and \$22,500 per year for indemnity.

OHIO:

The Legislature appropriated \$150,000 per year for two years for indemnity; also appropriated funds for operating, about \$25,000 per year.

OKLAHOMA:

The Legislature appropriated \$25,000 per year for two years for indemnity, and repealed the law paying indemnity before slaughtered. Also changed the indemnity law so that the State can pay 50 per cent of appraisal, which is limited to \$150.00 for pure-breds and \$50.00 for grades.

OREGON:

There were four separate County Dairy Herd and Meat Inspection laws passed at this session of the Legislature. These laws provide for the appointment of a County Dairy Herd and Meat Inspector, who is to test all the dairy cattle in each county at least once during every year, and inspect animal carcasses that are suspected of being infected with any infectious or contagious disease. Practitioners are appointed to do this work, and they are paid on the average of \$10.00 per day for their services. This fund is accumulated through a charge of 35 cents per head for every animal tested, which moneys are turned into the County Fund, out of which these officials are paid. Oregon now has seven County Dairy Herd and Meat Inspectors.

The Legislature appropriated \$56,000 for all live stock sanitary work for the two years beginning July 1, 1923, \$15,000 of which will be available for indemnity each year, and the same amount from the counties, making \$30,000 per year in all. The amount of indemnity was reduced from one-third to one-fourth of the difference between the appraisal and salvage. Maximum for grades \$20.00, and pure-breds \$40.00, to be gradually reduced until January 1, 1927, when it will be \$5.00 for grades and \$20.00 for pure-breds.

PENNSYLVANIA:

The Administrative Code, or reorganization bill, reduces the number of departments by consolidating numerous ones. The Bureau of Animal Industry is done away with, along with the statutory positions of the State and the Deputy State Veterinarian. It provides for an executive board, consisting of the Governor and four department heads, which create bureaus, make appointments, adjust salaries, etc.

The Pennsylvania State Board of Veterinary Medical Examiners and Registrars is placed under the Department of Education, with the Secretary of Education as member ex-officio. The board itself (examining board) remains the same, consisting of five veterinarians appointed by the Governor.

House Bill No. 602, introduced by Dr. W. A. Haines, representative from Bucks County, provides for an appropriation of \$100,000 for the Veterinary School, University of Pennsylvania, as well as free tuition for residents of Pennsylvania desiring to take the course in veterinary medicine.

The Act of March 19, 1923, provides for the money derived from the Dog Law to care for the maintenance of the Bureau of Animal Industry and the paying of indemnity for cattle condemned and killed on account of transmissible diseases.

It is estimated that this will allow \$175,000 per year for indemnities and \$100,000 per year for operation. Also passed a bill for \$235,000 to cover back claims, and a bill for \$60,000 to cover claims from January 1, 1923, to June 30, 1923.

RHODE ISLAND:

The Legislature appropriated \$22,000 for all tuberculosis eradication work for the year ending November 30, 1923.

SOUTH CAROLINA:

The Legislature appropriated \$10,000 per year for operating expenses and \$4,000 per year for indemnity. The indemnity fund can be increased, if necessary, by budget commission.

SOUTH DAKOTA:

The Legislature appropriated \$330,000 per year for indemnity for two years, beginning July 1, 1923. Also \$7,500 per year for operation. Passed a bill permitting counties to cooperate.

TENNESSEE:

A bill was introduced to modify the present veterinary practice law, but, through the efforts of some of the veterinarians of the State, the author of the bill was persuaded to withdraw it, and consequently it never came up for final consideration.

The Legislature appropriated \$30,491 for the two-year period for all live stock sanitary work.

TEXAS:

A bill was defeated, introduced to allow non-graduates to become licensed and enjoy the same privileges as qualified veterinarians. It appears that the present veterinary practice act prevents some 800 or 900 empirics, located throughout the State, from practising, and they have endeavored to use every possible means to become legally qualified under the law. Although the proposed bill succeeded in passing the Senate Committee, with a favorable report, and passed the Senate with a large majority, by the time it was referred to the Committee of the House, the Texas veterinarians had knowledge of it, and immediately made strenuous efforts to secure the defeat of the measure. The Texas State Veterinary Medical Association employed an attorney, and each member was assessed for the purpose of defraying the incidental expenses. The veterinarians received splendid assistance from the medical profession throughout the State, as well as from a large number of prominent cattlemen and stockmen.

The Legislature appropriated \$20,000 per year for two years for indemnity

UTAH:

Appropriated \$5,000 per year for two years for operating expenses, and also passed a bill levying an annual tax of three mills on the value of all dairy and breeding cattle, which will raise about \$8,000 per annum for indemnity.

VERMONT:

Appropriated \$100,000 per annum for two years, about \$20,000 being for operation and \$80,000 for indemnity. Also passed a law, effective April 2, 1923, limiting appraisal to \$85.00 on grades and \$125.00 on pure-breds, State paying one-fourth difference between salvage and appraisal. Indemnity money is apportioned to each county in proportion to amount of assessed valuation of all property. If a county does not take up its allotment in six months' time, the money may be allotted to other counties.

VIRGINIA:

The Legislature appropriated \$25,000 per year for indemnity for two years, beginning March 1, 1923.

WASHINGTON:

An appropriation of \$50,000 was made for tuberculosis eradication work for two years.

Also appropriated \$15,000 to cover back claims. Also appropriated funds to carry five State inspectors, about \$20,000 per year. Passed bill giving authority to enforce tuberculin test on cattle exposed to or suspected of having tuberculosis.

WEST VIRGINIA:

The Legislature, at an adjourned session, appropriated \$32,220 to cover indemnity and operating expenses for next fiscal year.

WISCONSIN:

The Legislature appropriated \$255,000 for indemnity under the area plan, \$70,000 for same under accredited-herd plan, \$150,000 for same under private plan; total \$475,000 for indemnity per year for two years. Also appropriated \$75,000 per year for operating expenses for two years.

WYOMING:

The Legislature appropriated \$10,000 for indemnities for two years. Also \$29,080 for operating expenses for two years, about \$15,000 of which will be used for tuberculosis work.

BIBLIOGRAPHY ON BOVINE INFECTIOUS ABORTION

Note. For the past five or six years the annual report of the United States Live Stock Sanitary Association has contained a fairly complete bibliography on bovine infectious abortion, together with the report of the committee on infectious abortion. The report for 1922 failed to include this bibliography on account of a change in the personnel of the committee.

It is thought worth while to make this bibliography available without interruption, and the Editor of the Journal of the A. V. M. A. has kindly consented to provide the space necessary for this year, at the request of the former chairman of the abortion committee, who will be glad to receive notice of any corrections or omissions.

WARD GILTNER.

Beaver, Donald C., Boyd, W. L., & Fitch, C. P.

1922—A contribution to the bacteriology and pathology of sterility in cows with report of nineteen cases. *Jour. A. V. M. A.*, lxi, n.s. xiv, (5), pp. 469-503.

Bevan, E. W.

1921—Infectious abortion of cattle and its possible relation to human health. *Vet. Rec.*, xxxiii (1746), pp. 1005-1012; also in *Rhodesia Agr. Jour.*, xviii (6), pp. 582-594.

Bongardt, D.

1921—Experiments on the distribution and significance of infectious abortion and the accompanying vaginal catarrh. *Arch. f. Wiss. Tierhkl.*, Bd. xlvii (15).

Cotton, W. E.

1922—The character and possible significance of the Bang abortion bacillus that attacks swine. *Jour. A. V. M. A.*, lxii, n.s. xv (2), pp. 179-192.

Church, H. R., Ridge, W. H., Barnes, M. F., & Marshall, F. A.

1921—Infectious abortion and sterility. *Penn. Dept. of Agr., Bur. Ani. Ind.*, *Gen. Bul.* 363, iv (12).

Carpenter, C. M.

1922—The bacteriology of the female reproductive organs of cattle and its relation to the diseases of calves. A thesis for the degree of Ph. D., Cornell University.

Edwards, J. T.

1921—Bovine abortion and its control. *Vet. Rec.*, n.s. i (37), pp. 721-734; and (38), pp. 739-748.

Extension Service, State College of Washington, Pullman.

1922—Abortion disease of cattle. *Bul.* 77.

Fleischner, E. C., Vecki, M., Shaw, E. B., & Meyer, K. F.

1921—The pathogenicity of *B. abortus* and *B. melitensis* for monkeys. Studies on the genus *Brucella* *nov. gen.* iii. *Jour. Inf. Dis.*, xxix (6), pp. 663-698, fig. 4.

Fitch, C. P. *et al.*

1922—Report of the A. V. M. A. Committee on Abortion. *Jour. A. V. M. A.*, lxii, n.s. xv (2), pp. 245-246.

Fitch, C. P.

1922—The isolation of *Bact. abortus* (Bang). *Jour. Inf. Dis.*, xxxi (3), p. 233.

1922—The control of bovine infectious abortion. *North Am. Vet.*, iii (3), p. 114.

Grapp, G. H.

1921—Contagious abortion. Tenth Ann. Rpt. Internat. Asso. Dairy and Milk Inspectors. p. 182.

Giltner, Ward, Huddleson, I. F., & Tweed, R. L.

1922—The role of the udder and its secretion in bovine infectious abortion. *Jour. A. V. M. A.*, lxii, n.s. xv (2), pp. 172-178.

Giltner, Ward, *et al.*

1921—Report of committee on abortion. Proceedings of the Twenty-fifth Ann. Meet. U. S. Live Stock. San. Assoc., pp. 44-57.

Glockner.

1921—Immunity in infectious abortion due to bactericidal materials. Deut. Tierärztl. Wehnschr., xxvii (49), pp. 627–629.

Groome, H. B., & McCoy, J.

1922—Bovine sterility and its treatment. Jour. A. V. M. A., lxi, n.s. xiv (6), pp. 627–636.

Hadley, F. B., & Beach, B. A.

1922—An experimental study of infectious abortion in swine. Univ. of Wis. Agri. Exp. Sta. Res. Bul. 55.

Hallman, E. T.

1920—Further studies on the pathology of the reproductive organs in sterility. Mich. Agr. Exp. Sta. Rpt., 1920, pp. 288–303.

1921—Studies in the diseases of the reproductive organs of cattle. Mich. Agr. Exp. Sta. Tech. Bul. 54, pp. 3–23.

Hayes, F. M.

1922—Some studies in swine abortion. Jour. A. V. M. A., lx, n.s. xiii (4), p. 435.

Huddleson, I. F.

1921—The susceptibility of swine for *Bact. abortus* (Bang). Mich. Agr. Exp. Sta. Quar. Bul. 4.

1922—A study of the pathogenicity of several strains of *Bact. abortus* (Bang). Mich. Agr. Exp. Sta. Tech. Bul. 52.

Jorgensen, G. E.

1922—The importance of *Bacillus abortus* as compared with that of other invaders. Jour. A. V. M. A., lxi, n.s. xiv (3), p. 273.

Jensen, C. O.

1921—Om Bekaempelsen af Kvaegets Smitsomme Kastning. (On the suppression of contagious abortion in cattle.) Maanedssk f. Dyrlaeger, Copenhagen, xxxiii, pp. 305–321. Abst. of Bact., vi (5), p. 232.

Khaled, Z.

1921—A comparative study of bovine abortion and undulant fever from the bacteriological point of view. Jour. Hyg., xx (4), p. 21. Idem. Jour. Hyg., xx (4), pp. 319–329. Abst. in Trop. Vet. Bul. Aug. 31, 1922, p. 78. Abst. in Jour. A. V. M. A., lxii, n.s. xv (2), p. 223.

Kalkus, J. W.

1922—Abortion disease of cattle. State Col. of Wash. Ext. Ser. Bul. 77.

Little, Ralph B., & Orcutt, Marion L.

1922—The transmission of agglutinins of *Bacillus abortus* from cow to calf in the colostrum. Jour. Exp. Med., xxxv (2), pp. 161–171.

Muller, Fr.

1921—Is it correct to draw conclusions as to the immunizing action in cattle which have been treated with preparations for abortion from the antibody production? Berl. Tierärztl. Wehnschr. 1921, s. 364.

1921—The formation of antibodies in cattle treated against infectious abortion with antektrol, abortin, etc. Berl. Tierärztl. Wehnschr. 1921, s. 268.

Meyer, K. F., Shaw, E. B., & Fleischner, E. C.

1922—The pathogenicity of *B. melitensis* and *B. abortus* for guinea pigs. Studies on the genus *Brucella* nov. gen. iv. Jour. Inf. Dis., xxxi (2), pp. 159–198.

Menniger, R.

1918—Contribution to abortion in sheep. Berl. Tierärztl. Wehnschr. Bd. xxxiv (17), s. 161–163. Exp. Sta. Rec., xlii, Apr. 1920.

Pomper, W.

1920—The occurrence of agglutinins and amboceptors in the milk of aborting cows. Wiener Tierärztl. Monatschr., vii (9), pp. 265–279, and (10), pp. 297–308. Abst. in Exp. Sta. Rec., xlvii (2), p. 185.

Rettger, Leo F., White, Geo. C., & Chapman, Leroy M.

1921—Infectious abortion in cattle. Storrs. Agr. Exp. Sta. Bul. 108.

Roberts, G. H.

1922—Infectious abortion. Dept. of Vet. Sc., Perdue Univ. Agr. Exp. Sta., leaflet 3.

Schroeder, E. C.

1922—The present status of vaccination against abortion disease of cattle. Jour. A. V. M. A., lxi, n.s. xiv (4), p. 363.

1921—Bureau of Animal Industry investigations on bovine infectious abortion. Proceedings of the Twenty-fifth Ann. Meet. U. S. Live Stock San. Asso., pp. 65-79.

Skaric, J.

1922—Ueber die Beziehungen des *Bac. melitensis* (Bruce) zum *Bac. abortus infect. bovum* (Bang). (The relations between *Bacillus melitensis* (Bruce) and *B. abortus infect. bovum* (Bang). Zeit. f. Hyg. u. Infektionskr., v. 95 (3), pp. 358-364. Idem. Abst. in Trop. Vet. Bul. Aug. 31, 1922, p. 79. Abst. in Jour. A. V. M. A., lxii, n.s. xv (2), p. 224.

Stickdorn.

1921—Concerning immunity and antibody production in animals which have been treated with abortin and other preparations. Berl. Tierärztl. Wehnschr., s. 364.

1921—Immunization with extracts or killed cultures of the Bang bacillus against infectious abortion. Berl. Tierärztl. Wehnschr., s. 509.

1921—The serological determination of the presence of abortion (Bang) by means of the agglutination test and Sachs-Georgi flocculation reaction. Berl. Tierärztl. Wehnschr., s. 109.

Steck, Werner.

1921—Experiments on the bacterial flora of a normal cow udder. Rpt. Swiss Farm Yearbook, 1921.

Traum, J., & Hart, G. H.

1922—Abortion disease manifestations in a dairy herd without demonstrable cause. Jour. A. V. M. A., lxi, n.s. xiv (1), pp. 15-31.

Thomsen, Alex.

1920—Ein durch Spirillen bedingtes Infektiöses Verkalben. (Infectious abortion produced by spirilla.) Deut. Tierärztl. Wehnschr., Bd. xxviii, s. 405-407.

Winkler, M. R.

1919—The elimination of *Bacillus abortus* (Bang) with the milk. Inaug. Diss., Tierärztl. Hochschule, Dresden, Dresden, 1919, p. 90.

Williams, W. L.

1922—The control of *B. abortus* infection in cattle by vaccination with living bacteria. Cornell Vet., xii (2), pp. 110-131.

1921—Suggestions for the improvement of the reproductive efficiency of cattle. Proceedings of the Twenty-fifth Ann. Meet. U. S. Live Stock San. Asso., pp. 57-65.

1922—Observations upon reproduction in a pure-bred beef herd. Cornell Vet., Jan. 1922, p. 1.

1921—The diseases of the genital organs of domestic animals. Ithaca, N. Y., Author, 1921. pp. xviii 856, pls. 8, figs. 243.

Williams, W. W.

1922—Observations on reproduction in a pure-bred dairy herd. Cornell Vet., Jan. 1922, p. 19.

Wirthl, W.

1921—The presence of infection with the Bang abortion bacillus in diseases of the genital tract in clinically abortion-free experimental cattle, and its diagnosis by means of the agglutination test and ophthalmic reaction. Vet. Med. Diss. Berlin, 1921.

1921—Experiments on the therapeutic use of protargol-urea-disinfection pegs for acute vaginal catarrh of cattle. M. Tierärztl. Wehnschr., 72, s. 577.

Zwick, Zeller, Krage & Gminder.

1920—Immunization against infectious abortion. Arb. Reichs. Ges. A., 1920, 52, s. 375-467.

Ziemann, H.

1922—The treatment of Malta fever and contagious abortion of cattle with collargol and similar preparations. Deut. Med. Wehnschr., xlvii, (18), p. 500. Idem. Abst. in Trop. Vet. Bul. Aug. 31, 1922, p. 79. Abst. in Jour. A. V. M. A., lxii, n.s. xv (2), p. 225.

COMMUNICATION

A VETERINARIAN IN BRAZIL

TO THE EDITOR:

It is with great pleasure, and with no reluctance, that I remit for my dues beginning September, 1923. Veterinary literature has to take the place, largely, of veterinary conversation in this vast country, where practicing veterinarians are to be found only in less than half a dozen of the largest cities of Brazil. Nor are there lots of fine openings here for veterinarians as yet.

The same conditions exist here that formerly existed in the States; comparatively cheap live stock, lack of appreciation of



Dr. G. A. Roberts, Official Veterinarian, Inspecting the Champion Native-Bred Stallion at the District Fair, Lavras, Minas, Brazil, July 14, 1923 (mid-winter).

veterinary training and every stock owner or farm-hand his own veterinarian. Things will be different some day, for improvements are taking place along all lines.

There are several veterinarians in the country, however, but with very few exceptions they are all federal or state men, and they are found in only a limited number of the states. The only opportunity for an outside veterinarian is, either to secure a Government appointment, on a three-year contract, as the writer did in 1919, through no effort of his, or to join an Agricultural Mission School teaching staff, as the writer did seven

months ago. He'll not get rich at the latter but he will find a much greater field of usefulness along veterinary lines than in an official position.

The writer had hoped to induce the State of Federal government to establish a veterinary post for this District, in connection with the Agricultural College, but as yet it has not been accomplished, hence the writer is drawing the magnificent salary of two contos of reis, at present rate of exchange \$200.00 and board, per year. However, the work is pleasant, the students are interesting, and the climate superb, in a country of unlimited possibilities.

So far as I know I believe I am the first veterinarian teaching in a foreign mission school. The school here is a Presbyterian institution known as the "Instituto Evangelico." It is divided into three parts, collegio or primary department, gymnasio or high school department, and Escola Agricola or Agricultural College.

The enclosed view shows the writer, as official veterinarian at the District Fair of Lavras, inspecting the champion native-bred stallion. The Fair was held on the college campus the middle of July. It is an annual affair and financed by the Agricultural Society of this District.

Please find enclosed check for dues and lapel emblem. There are three or four Fords in this district but I have no use for one, nor a car at present, hence need no emblem for same.

G. A. ROBERTS.

Lavras, Minas, Brasil, September, 1923.

BIG MEETING FOR OHIO

Dr. Harry T. Moss, Secretary of the Ohio State Veterinary Medical Association, has plans pretty well in hand for the coming annual meeting, to be held in Columbus, January 9-10-11, 1924. Indications point to one of the largest meetings ever held by this Association, and Secretary Moss already has the promises of a number of nationally prominent veterinarians, who will contribute to the program. One full day will be devoted to a clinic, which will be divided into four sections. A banquet will be served on the evening of the second day. Headquarters will be at the Deshler Hotel.

NECROLOGY

OTTO C. BARDES

Dr. Otto C. Bardes died at Stapleton, N. Y., May 14, 1923. Dr. Bardes was born in Stapleton, N. Y., August 29, 1892. He graduated from the Senftner Preparatory School, and from the Veterinary School, University of Pennsylvania, class of 1913. He practiced, for a time, in Grove City, Pa. He was a member of Alpha Psi Fraternity.

PAGE L. GILBERT

Dr. Page L. Gilbert died at Kansas City, Mo., September 5, 1923. Dr. Gilbert was born at Monova, Iowa, December 25, 1882. He was a graduate of the Veterinary Division, Iowa State College, class of 1906. He entered the service of the Bureau of Animal Industry the same year, and remained with the Bureau until the time of his death. He was assigned to Virus-Serum Control work. Dr. Gilbert's death was very sudden, the result of angina pectoris. He was buried at Ottumwa, Iowa. He is survived by his widow and widowed mother.

We extend our heartfelt sympathy to Dr. and Mrs. F. Y. S. Moore, of McAlester, Oklahoma, in the death of their 6-year-old son "Billie," who died November 3, from diphtheria.

MARRIAGES

Dr. Rex D. Bushong (K. S. A. C. '21) to Miss Vivian Hall, both of Manhattan, Kansas, August 5, 1923.

Dr. E. A. Tunnicliff (K. S. A. C. '21) of Champaign, Ill., to Miss Gertrude Cate, of Manhattan, Kansas, July 5, 1923.

Dr. Erwin Veranus Moore (Corn. '17) of Cortland, N. Y., to Miss Lulu Miranda Williams, of Owego, N. Y., November 10, 1923.

Dr. D. S. Weaver (K. C. V. C. '16) to Miss Kathryn Barnoske, both of Coon Rapids, Iowa, at Des Moines, Iowa, November 3, 1923.

BIRTHS

To Dr. and Mrs. James F. Adee, of Stanberry, Mo., a daughter, May 7, 1923.

To Dr. and Mrs. C. E. Zollinger, of Junction City, Kans., a son, July 18, 1923.

To Dr. and Mrs. B. E. McCullough, of Eagle Grove, Iowa, a daughter, in October.

To Dr. and Mrs. G. W. Huegerich, of Breda, Iowa, a son, Paul Leonard, October 13, 1923.

To Dr. and Mrs. Given, of Marcus, Iowa, a daughter, Bernadette, October 27, 1923.

To Dr. and Mrs. Robert V. Christian, of Wichita, Kans., a son, David Matthews, June 7, 1923.

To Dr. and Mrs. William Dohrer, of Ayrshire, Iowa, a son, William Joseph, November 4, 1923.

PERSONAL

Dr. Luther E. Olson (K. C. V. C. '11) is located in Avon, Ill.

Dr. Hilborn H. Groat (K. S. A. C. '21) is now at Chase, Kansas

Dr. F. G. Cuervo (U. P. '10) is general manager of a large sugar plantation in Cuba.

Dr. L. H. Adams (U. P. '09) has been transferred from Bellows Falls to Montpelier, Vt.

Dr. H. B. Thompson (Iowa '19) has changed locations, from Storm Lake to Danbury, Iowa.

Dr. C. E. Zollinger (K. S. A. C. '19) is a member of the Rotary Club of Junction City, Kan.

Dr. Chas. H. Rosenstiel (Chi. '08) gives his new address as 419 Saxby Avenue, Freeport, Ill.

Dr. Millard Myers, Jr., (Corn. '18) has removed from Evart, Ky., to La Follette, Tenn. (Box 15.)

Dr. G. A. Handley (Chi. '04), who recently located in Chillicothe, Ohio, has gone to Macon, Miss.

Dr. William S. Rader (K. C. V. C. '10) has removed from Smackover to Camden, Ark., P. O. Box 358.

Dr. Ching Sheng Lo (K. S. A. C. '23) is teaching in the Nan Wu Middle School, Horan, Canton, China.

Dr. C. A. Arias (U. P. '10), of Havana, Cuba, is Secretary-Treasurer of the Cuban Veterinary Association.

Dr. A. W. Schuppan (Amer. V. C. '90) expects to spend the winter on Jekyl Island, Brunswick, Georgia.

Dr. George S. Jermyn (Ont. '00) has been transferred from Osoyoos, British Columbia, to North Battleford, Sask.

Dr. Fred W. Lange (Colo. '23) has removed from Aberdeen, So. Dak., to 220 South Liberty Street, Salem, Ore.

Dr. John H. Smyth (McK. '17) has removed from Wharton, Texas, and established a practice at Halls, Tenn.

Dr. W. D. Foss has a new location. He is now at Cooperstown, No. Dak., having left Church's Ferry, same state.

Dr. H. H. Bishop (Ont. '15), formerly stationed in Toronto, Ont., is now at McAdam Junction, New Brunswick.

Dr. E. E. Patterson (Gr. Rap. '01), of Detroit, Mich., recently installed an X-ray apparatus in his small animal hospital.

Dr. Donald Kemp (Ont. '10) has accepted a position in the Meat Inspection Division of the Detroit (Mich.) Board of Health.

Lt. Paul R. King (K. S. A. C. '15) is now stationed at Fort Des Moines, Iowa, after three years of foreign service in Panama.

Dr. E. H. Marquardt (Ohio '23) has changed his location from Atlanta, Ill., to Bloomington, Ill. His address is 1615 W. Locust.

Dr. D. M. Purdy (K. S. A. C. '17) has been transferred from Vinita, Okla., to Wichita, Kans. He is located at 1406 So. Main Street.

Dr. William E. Nicholls (Ont. '19) has been transferred from Winnipeg, Manitoba, to Toronto, Ontario. He is at 357 Lander Avenue.

Dr. John F. Erdley (K. S. A. C. '20), formerly of Buena Vista, Colo., has taken over the practice of Dr. I. A. Phinney, at Loveland, Colo.

Dr. R. E. Hammond (Mich. A. C. '22) has resigned his position with the Detroit Board of Health to accept a position in South Bend, Ind.

Dr. Fred G. Hartwig (K. S. A. C. '16), of Goodland, Kans., has been commissioned a First Lieutenant in the Veterinary Officers' Reserve Corps.

Dr. Samuel H. Johnston (U. P. '96) has moved from Philadelphia to New York City. He gives his new address as 611 West 112th Street, Apt. 5.

Dr. Hugh F. J. Arundel (Cinn. '19), on tick eradication work with the B. A. I. in Georgia, has been transferred from Blakely to Thomasville, Ga.

Dr. J. J. Frey (K. S. A. C. '14) is Superintendent of Dairy Service, Division of Animal Husbandry, California Department of Agriculture, Sacramento, Calif.

Dr. Robert Armstrong (Det. '97) of Detroit, Mich., has disposed of his practice to Dr. J. R. McCarthy (Ont. '15), who was his assistant for a number of years.

Dr. J. A. Howarth (K. S. A. C. '23) has accepted a position on the teaching staff of the School of Veterinary Medicine, of the Washington State College, at Pullman.

Dr. D. E. Davis (K. S. A. C. '22) has left Manhattan, Kansas, to accept a position in the Avian Pathology Laboratory, University of California, Petaluma, Calif.

Dr. A. F. Staub has been transferred from Buffalo, N. Y., to New Orleans La., as B. A. I. inspector in charge, succeeding Dr. R. W. Tuck, who has gone to England.

Dr. C. J. Cook (K. C. V. C. '13) of the B. A. I. force, formerly stationed in Omaha, Nebr., has been transferred to Sacramento, Calif. He is living in Red Bluff, Calif.

Dr. Jesse H. White (Chi. '05) has changed his abode. Formerly at 7926 Bennett Avenue, Chicago, he now receives his mail at 1618 South Third Avenue, Maywood, Ill.

Dr. S. R. Johnson (K. S. A. C. '20) is in charge of the Animal Pathological and Diagnostic Laboratory, recently removed from the Health Department to the Department of Agriculture, at Lansing, Mich.

Dr. George G. Anderson (Ont. '13) of New York City,, believes in being prepared for any emergency. He is registered to practice in the States of New York, New Jersey, Connecticut and Massachusetts.

Dr. E. J. Frick (Corn. '19) has been advanced to the position of Professor of Comparative Medicine, made vacant by the resignation of Dr. W. E. Muldoon, on the faculty of the Veterinary Division of the Kansas State Agricultural College.

Dr. E. L. Reed (U. S. C. V. S. '11), formerly at Chipley, Florida, is now located at Pensacola, with the Florida State Live Stock Sanitary Board, on hog cholera control and tuberculosis eradication work. Dr. Reed's address is 1110 North Reus St.

Dr. J. G. Ferneyhough (U. S. C. V. S. '99) enjoys the triple distinction of being a vice-president of three large organizations at the same time, the American Veterinary Medical Association, the United States Live Stock Sanitary Association and the Southeastern States Veterinary Medical Association.

Dr. Wm R. Hinshaw (Mich. A. C. '23) is a member of the staff of the Department of Bacteriology, Kansas State Agricultural College, Manhattan, Kans. He holds the position of Instructor in Veterinary Serum Therapy and Poultry Diseases made vacant by the resignation of Dr. F. R. Beaudette (K. S. A. C. '19).

Dr. F. J. Baker (Corn. '05), county veterinarian of St. Lawrence County, has formed a partnership with Dr. J. R. Tremlett (Corn. '23), who has taken over his partner's extensive practice. Baker and Tremlett plan to erect a new and modern hospital in the near future, with facilities for the proper inspection of the meat and milk interests of Gouverneur, N. Y., of which they have charge.

Dr. George H. Hart (U. P. '03), of the University of California, writes that none of the members of the Division of Veterinary Science suffered any loss in the recent fire which devastated a large section of the residence district of Berkeley. The University buildings were entirely preserved, and, by great effort, the buildings used for stabling their experiment herd, on the eastern part of the campus, were saved.

Dr. J. B. Reidy (Corn. '02), of Augusta, Maine, Federal Inspector in charge of tuberculosis eradication in that State, addressed the fourth annual conference of local health officers, which was held in Augusta recently. Dr. Reidy's subject was "Tuberculosis in Cattle and Its Relation to the Milk Supply." A very fine account of the transactions of the conference, including Dr. Reidy's address, appeared in the Daily Kennebec Journal, of October 31.

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 735 Book Building, Detroit, Mich.

C. H. STANGE, President, Ames, Iowa.

M. JACOB, Treasurer, Knoxville, Tenn.

Executive Board

GEO. HILTON, 1st District; T. E. MUNCE, 2nd District; D. S. WHITE, 3rd District
J. A. KIERNAN, 4th District; C. E. COTTON, 5th District; B. W. CONRAD,
6th District; CASSIUS WAY, Member at Large, CHAIRMAN.

Subcommittee on Journal

D. S. WHITE

J. A. KIERNAN

The American Veterinary Medical Association is not responsible for views or statements published in the JOURNAL, outside of its own authorized actions

Reprints should be ordered in advance. Prices will be sent upon application.

Vol. LXIV, N. S. Vol. 17

January, 1924

No. 4

A YEAR HAS PASSED

Time passes quickly when pleasantly spent. It seems hardly possible that a year has rolled around since entering upon our new work. It has been a year of new experiences. There have been trials and tribulations, delays, set-backs, and unforeseen situations, but these are rapidly being forgotten as our affairs get into better shape and the road becomes smoother. We believe that by the time another year rolls around that every rattle and squeak will have entirely disappeared. Indications now point that way.

We would be remiss if a word of thanks were not spoken in behalf of those who have so materially assisted in getting things under way and keeping them going. We want to thank the former secretaries and former editors for their unstinted help; the officers and members of the Executive Board, for their suggestions and the encouragement they have given; the contributors of the articles which have enabled us to maintain the high standard of the JOURNAL established by our predecessors; our corps of abstractors, who have sifted current scientific periodicals for new material that is of interest to veterinarians; association secretaries who have supplied the splendid reports of their meetings; the members of our news-gathering staff,

who have sent in the hundreds of news items appearing from month to month; our advertisers for their support and cordial cooperation; and last but not least our two assistants, who have kept the machinery going while we have been away from the office.

Thanks to all of you. May the New Year have much in store for everybody.

PLANS FOR DES MOINES

At the meeting of the Executive Board, in Chicago, December 4, Des Moines, Iowa, was officially designated as the meeting place for 1924. The dates for the convention were also selected—August 19-20-21-22.

If you will look at your calendar you will find that the opening date is a Tuesday. This is a departure from programs of recent years. There has been considerable of a demand for shortening our meetings to four days, coming especially from the practitioners. It was decided to try a four-day meeting this year, and to start on Tuesday.

Monday, August 18, will be set aside for meetings of the Executive Board and the various committees. It is hoped that members of those committees unable to complete their reports prior to the meeting will start a day early, gather in Des Moines the day before the meeting opens, complete their reports and have them ready to present when they are called for.

The program proper will be crowded into three days, Tuesday, Wednesday and Thursday. On Friday, August 22, we will be taken to Ames, for a visit to the Iowa State College, where entertainment will be provided for the ladies and a splendidly arranged clinic for the men.

The great Iowa State Fair opens on Saturday, August 23, and it is expected that a great many will want to take in this great attraction.

The officers of the several sections met in Chicago, December 6, and, with President Stange and Secretary Hoskins, went over plans for the literary program. It is planned to have the usual two sessions of the three sections, and one general session exclusively for the reading of papers on subjects in which all are interested.

Suggestions for the program are in order at any time. It is your Association. Let us hear from you.

Dr. Stange has appointed the following Local Committee on Arrangements: Dr. H. E. Bemis, Ames, Iowa, Chairman, with the following to assist him: Drs. H. D. Bergman, Ames, Iowa; E. R. Steel, Grundy Center, Iowa; John Patterson, Hedrick, Iowa; H. J. Shore, Fort Dodge, Iowa; R. D. Wall, P. Malcolm, W. J. Miller, C. W. Deming, and Col. J. H. Gould, all of Des Moines, Iowa.

A TEMPEST IN A TEAPOT

Thus is characterized the present situation with regard to high bacterial counts in milk, in a recent article¹ by Dr. Archibald R. Ward. There appear to be two main factors which have contributed to the perplexities of the present situation.

During recent years, more specifically during the Great War, dealers in pasteurized milk, as well as municipal health authorities, have been confronted with the problem of correctly interpreting high bacterial counts. We have all been led to associate high bacterial counts with slovenly milk-plant methods. However, in many instances, impartial investigations have failed to show any laxness in the methods of handling this high-count milk.

One of the main factors that appear to contribute to discordant results is undoubtedly the culture medium used in making the plates employed for estimating the bacterial counts of milk samples. Since the war, many laboratories have been employing various ingredients of American origin in the preparation of culture media, and as the matter now stands, instead of having one standard medium, we have several, the result of using ingredients openly known to vary in composition. For instance, a certain brand of commercial peptone used in the preparation of agar will afford a much more luxuriant growth of certain organisms than will some other brand of commercial peptone. This variation in bacterial counts, made from the same sample of milk but on different batches of culture media, has been brought out by J. W. Yates, Director, Food and Dairy Division, of the Hospital and Health Board, of Kansas City, Mo., in a paper read before the American Public Health Association at Boston.

The other factor, heat-loving bacteria, is brought out by the

¹ Dairy Products Merchandising, 1 (7), November 1923.

same investigator, working with Dr. J. J. Glover, Veterinarian, of the Hospital and Health Board, Kansas City, in a paper recently read before the International Association of Dairy and Milk Inspectors at Washington, and this paper is really epoch-making.

Briefly stated, it would appear that there are certain organisms which thrive at pasteurization temperatures (140 to 145° F.). When a given sample of milk contains any of these organisms, the longer it is held at the pasteurization temperature the longer these organisms will have to grow. Consequently when the bacterial count of the sample is made after heating several hours, paradoxical as it may seem without a knowledge of these facts, the greater the number of organisms will be. In a sample of milk held at pasteurizing temperature for three hours, or in the product of a pasteurizing apparatus that has been in operation for this time or longer, the count of the pasteurized milk may be greater than that of the raw milk. There are at least twelve kinds of these thermophilic organisms known to bacteriologists, these growing best at temperatures as high as 172° F. Fortunately, none of these organisms is pathogenic.

After thoroughly discussing these two very important questions of culture media and thermophilic organisms, Dr. Ward concludes as follows: "Milk which is rich, clean, has been properly pasteurized so as to be safe with regard to pathogenic germs, and keeps sweet and in satisfactory condition during the period required by the consumer is good milk regardless of what may be its bacterial count."

IT PAYS BIG DIVIDENDS

At a recent meeting of a local veterinary association, one of the members demonstrated an operation which he had seen performed at the clinic of the A. V. M. A. meeting held in St. Louis in 1922. The operation in question was the one performed by Dr. T. H. Ferguson, of Lake Geneva, Wisconsin, for the relief of obstruction of the teat canal. The member in question stated that during the period of a year, which had elapsed following the St. Louis meeting, he had performed this operation on approximately forty cows, with splendid success in every case. The condition, which had previously been one of the "bug-bears" of a large dairy practice, no longer offered any difficulties

so far as a remedial operation was concerned. This little incident is recited merely for the purpose of refuting any statements to the effect that it does not repay a practitioner to attend our national meetings.

EXECUTIVE BOARD ELECTION

This year an Executive Board election will be held in District No. 4, consisting of Kentucky, West Virginia, Virginia, Maryland, District of Columbia, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida, Cuba, and South America. The term of office for the present member of the Executive Board from this district will expire at the close of the 1924 meeting in Des Moines; and the election to be held is for the purpose of electing a member to fill this vacancy. Nominating ballots will be mailed shortly after January 1st, to all members of the Association located in District No. 4, providing their dues for the current year have been paid.

COMING VETERINARY MEETINGS

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York City. Jan. 2, 1924.

Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.
California Veterinary Practitioners' Week, University of. Jan. 7-10, 1924. University Farm, Davis, Cal.

Indiana Veterinary Medical Association. Claypool Hotel, Indianapolis, Ind. Jan. 8-9-10, 1924. Dr. R. H. Boyd, Secretary, 446 E. 10th St., Indianapolis, Ind.

Pennsylvania Annual Conference for Veterinarians, University of. Philadelphia, Pa. Jan. 8-9, 1924. Dr. Louis A. Klein, Dean, 39th St. and Woodland Ave., Philadelphia, Pa.

New Jersey, Veterinary Medical Association of. Newark, N. J. Jan. 10, 1924. Dr. P. B. Silvester, Secretary, Princeton, N. J.

Ohio State Veterinary Medical Association. Deshler Hotel, Columbus, Ohio. Jan. 9-10-11, 1924. Dr. Harry T. Moss, Secretary, 640 S. Main St., Dayton, Ohio.

Cornell Veterinary Conference, Ithaca, N. Y. January 10-11, 1924. Dr. V. A. Moore, Dean, N. Y. State Veterinary College, Ithaca, N. Y.

Virginia State Veterinary Medical Association. Richmond, Va. Jan. 10-11, 1924. Dr. Geo. C. Faville, Secretary, Hampton, Va.

- Iowa Veterinary Association. Hotel Savery, Des Moines, Iowa. Jan. 15-16, 1924. Dr. E. R. Steel, Secretary, Grundy Center, Iowa.
- Iowa Practitioners' Short Course. Iowa State College, Ames, Iowa. Jan. 17-18, 1924. Dr. C. H. Stange, Dean, Ames, Iowa.
- Oklahoma State Veterinary Medical Association. Huckins Hotel, Oklahoma City, Okla. Jan. 16-17, 1924. Dr. L. B. Barber, Secretary, Live Stock Exchange Bldg., Oklahoma City, Okla.
- Minnesota State Veterinary Medical Association. Ryan Hotel, St. Paul, Minn. Jan. 16-17, 1924. Dr. C. P. Fitch, Secretary, University Farm, St. Paul, Minn.
- Pennsylvania Veterinary Medical Association and Allied Agricultural Association Conference. Harrisburg, Pa. Jan. 22, 1924. Dr. H. R. Church, Secretary, Harrisburg, Pa. ✓
- Massachusetts Veterinary Association. American House, Boston, Mass. Jan. 23, 1924. Dr. C. H. Playdon, Secretary, Reading, Mass. ✓
- Colorado Veterinary Medical Association. Denver, Colo. Jan. 23-24, 1924. Dr. I. E. Newsom, Secretary, Fort Collins, Colo. ✓
- South Carolina Association of Veterinarians. Jefferson Hotel, Columbia, S. C. Jan. 28, 1924. Dr. M. R. Blackstock, Secretary, Spartanburg, S. C. ✓
- Michigan Agricultural College Short Course for Veterinarians. East Lansing, Mich. Jan. 28-Feb. 1, 1924. Dr. Ward Giltner, Dean, East Lansing, Mich. ✓
- Wisconsin Veterinary Medical Association and Veterinary Short Course. College of Agriculture, Madison, Wis. Jan. 29-30-31 and Feb. 1, 1924. Dr. O. H. Eliason, Secretary, Madison, Wis. ✓
- Kentucky Veterinary Medical Association. Hotel Latham. Hopkinsville, Ky. Feb. 6-7, 1924. Dr. J. A. Winkler, Secretary, Newport, Ky. ✓
- Kansas Veterinary Medical Association and the Third Annual Conference of Kansas Veterinarians. K. S. A. C., Manhattan, Kans. Feb. 6-7-8, 1924. Dr. I. J. Pierson, Secretary, Lawrence, Kans.
- Missouri Valley Veterinary Association. Kansas City, Mo. Feb. 19-20-21, 1924. Dr. E. R. Steel, Secretary, Grundy Center, Iowa.

ANESTHESIA, GENERAL AND LOCAL*

By H. E. BEMIS, W. F. GUARD and C. H. COVAULT

Iowa State College, Ames, Iowa

According to Flagg¹ the history of anesthesia may be broadly divided into two periods: The pre-anesthetic period and the anesthetic period. The pre-anesthetic period ends and the anesthetic period begins with the discovery of ether in 1842 and its general introduction in 1846.

THE PRE-ANESTHETIC PERIOD

This period includes the centuries previous to 1842. In studying the literature of this early period, one is impressed with the many references made to assuaging and allaying pain. One of the early references to this is made by Homer, in the *Odyssey*.

Again, in the 16th century, DuBartus,² a poet, says in one of his writings:

*"Even as a surgeon minding off to cut
Some cureless limb, before in use he put
His violent engines on the vicious member,
Bringeth his patient in a senseless slumber,
And griefless then, guided by use and art
To save the whole, cuts off the affected part."*

A similar passage² occurs in a play by Thomas Middleton, the Elizabethan poet, quoted by Dr. Walsh

*"I'll imitate the pities of old surgeons
To this lost limb, who, ere they show their art
Cast one asleep, then cut the diseased part."*

Early in the seventeenth century, Shakespeare² makes Cornelius, a court physician, prescribe a drug which

*"Will stupify and dull the sense awhile;
. . . . but there is
No danger in what show of death it makes,
To be more fresh, reviving."*

From this ancient history, viewed in the light of our present knowledge, we see an ever-crying need and perhaps a prophecy of some of our latest attainments in general anesthesia.[†]

*Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

†For more complete history see bibliography.

ANESTHETIC PERIOD

This period was born in the year 1842, and the names of such investigators as William T. G. Mortem, Crawford W. Long, C. T. Jackson, H. Wells, and others, are permanently recorded as having taken an active part in establishing the use of ether as an anesthetic in surgery. Local anesthesia, though studied several years during the middle of the 19th century by such men as Schurzir, Godeke, Bennett, Koller, and others, was not well established until Von Anrep, in 1879, made rather a thorough investigation of cocaine, using a weak solution under the skin of his arm. The discovery of the hypodermic syringe by F. Rynd,[§] of Edinburgh, in 1845, made possible a more extensive study and application of local anesthetics.† Since the birth of these two methods of relieving pain there has been so much progress and so many separate volumes written upon both general and local anesthesia, that one cannot be expected to present a brief history that would be adequate for such an important subject.

IMPORTANCE OF ANESTHESIA

We need not dwell upon the importance of anesthesia since it is universally admitted that practically all surgical procedure, if not progress, in *human* surgery at least, can be directly or indirectly credited to anesthesia. We can, as a profession, very profitably take an inventory and compare our attainments and present status in the field of veterinary surgery to that of human surgery. We need only to call attention to such surgical contributions as those of Keen, Warbasse, Doyen, etc., and such standard books on anesthesia as Braun, translated by Shield;[§] Hewitt's "Anaesthetics and Their Administration," "The Art of Anaesthesia," by Flagg; "Regional Anaesthesia, Its Technical and Clinical Application," Labat;[§] "Local Anaesthesia," Allen: "Anoci-association," Crile and Lower; and numerous others, to appreciate how much we have actually progressed.

In contrast, we wish to call your attention to the living existence of a very familiar scene to most every veterinary practitioner who attends clinics, we dare say, at practically any state, sectional, or even national association meeting. We talk, preach, demonstrate and unanimously agree upon the finer points so important to every-day practice and progress, and then call upon and permit someone of our number to step forth

†For complete history of local anaesthesia refer to Local Anaesthesia, by Allen; Local Anaesthesia, by Braun and Shields; The Art of Anaesthesia, by Flagg.

boldly in the arena as of old, and apply his Stone Age method of acrobatic butchery without fear and trembling, for the helpless patient is so securely confined and otherwise tortured, that the hero brandishing his modern array of instruments is at no time in any degree of danger. By permitting such crude and inhumane demonstrations at our meetings, we are encouraging the general practice of such methods when we should be using every means to suppress them.

Is it any wonder that organizations, such as our humane societies, are agitating legislation which would make anesthetics compulsory in veterinary surgery? Would it not be elevating our standards to lead and enlighten the general public in regard to such matters rather than be criticized and forced by laymen? Broadly speaking, there is no part of veterinary practice any more important to the practitioners' success than his surgery. It is in this phase of practice that modern methods and procedure are most keenly looked for by the laymen, and constitute an important index to the practitioner's rating as a professional man. The fact that surgery has been pushed into the background, and even practically eliminated by some, is no justification for ignoring the truth of the foregoing statement.

As an example, we wish to relate the following incident: A breeder of one of our best breeds of swine reported at the clinic one day with a valuable pig affected with a small umbilical hernia, giving the following history: A short time previously he had taken the pig to his local veterinarian for advice concerning a swelling in the region of the umbilicus. After making sure that an abscess was present, the veterinarian picked up a knife, and, without any preliminary steps whatsoever, opened the enlargement and liberated the pus. The owner became so alarmed that he hurried home, prepared some antiseptic solution in a clean pan, and, as thoroughly as he knew how, cleansed the abdominal wall and abscess cavity, after which he painted the process with tincture of iodine. Healing took place in a short time, but another swelling developed, and he decided to take the pig where he thought it would get modern treatment. The above history was not given in detail until after a definite diagnosis of umbilical hernia had been made and the operation had been completed to the entire satisfaction of the owner. He remarked that he now knew it was possible for veterinarians to perform the most delicate operation in an up-to-date manner, and that while his local veterinarian had been satisfactory in

certain respects he could not employ him in the future for any of his work.

Good clients are more plentiful and louder in their praises for the individual practitioner and the profession at large, when they receive that full measure of service which well qualified veterinarians should render. Aside from the humane side of the question, anesthesia is absolutely essential to good surgery. It permits of the development of finer technique, affords time and opportunity for the surgeon to recognize carefully and have due respect for anatomical structures, so that they may have the best possible opportunity for rapid repair following the operation.

For a number of years we have been enthusiastic students and advocates of anesthesia, and, while our accomplishments in this field to date by no means limit future possibilities of development, we do feel that we have made considerable progress. So much so that we can hardly conceive of an adequate excuse for surgical procedure without the use of some form of anesthesia.* The adoption of practical means for the application of local anesthetics has perhaps contributed more toward the possibilities of the general use of anesthesia than any other factor. When the application of anesthetics is confined to the use of general anesthetics, and only in certain selected cases, we are prone to become hardened to rough, inhumane procedure which leads not only to carelessness and indifference about the use of anesthetics in general but to poorer surgery as well. We not only feel that we have progressed in the use of anesthetics, but are confident that our general surgical technique has been improved by persistently studying this problem.

During the last $3\frac{1}{2}$ years we have kept accurate record of anesthesia covering 1020 cases, as follows:

LOCAL ANESTHESIA								
Horses and Mules	Cattle	Swine	Dogs	Cats	Sheep	Goats	Kangaroo	Total
188	18	159	41	0	1	3	1	411
GENERAL ANESTHESIA								
(including chloroform, chloral hydrate, ether and morphine)								
67	9	199	314	16	3	1	0	609

During the year 1922 our application of local anesthetics was 5.4 times greater than in 1920, while the use of general anesthetics was 1.6 times greater for the same years. We are glad

*Perhaps we are at a loss at the present time to apply the above statement satisfactorily to castrations of farm animals and spaying of heifers, but even here believe the practical objection to the use of anesthetics may be removed in time.

to admit that the progress we have made in the successful application of anesthetics in the different species under varying conditions has been largely responsible for the fact that such applications in our practice have increased practically threefold in three years.

In our discussion of anesthesia here we have not attempted an exhaustive treatise of the subject, but simply wish to present the methods we find to be most practical for every-day practice. Both local and general anesthetics have their limitations in general practice, but the successful application of local anesthetics alone and in combination with small amounts of general sedatives, such as chloral hydrate, will greatly reduce the indication for a general anesthetic. The principal factor in our own experience has been the adoption of proper technique of application.

LOCAL ANESTHESIA

In considering the subject of local anesthesia from the standpoint of practice, it is important that we have an understanding of first, the anesthetic agents; second, regional anatomy; third, instruments; and fourth, technique.

1. *Anesthetic Agents.* The foremost local anesthetic agents on the market today, with which we have had experience, are novocaine, procaine and apothesine, synthetic preparations, non-habit-forming and relatively non-toxic as compared with cocaine. A fourth, butyn, is receiving some attention as a possible substitute for cocaine in surface anesthesia, especially for eye work, since it is claimed to have little or no desiccating effect and does not affect the pupil. We are informed by Dr. N. S. Mayo that this preparation is receiving some general application in veterinary practice.

According to such a noted author as Braun,⁴ all local anesthetics produce their effect by a protoplasmic poisoning action, having a particular affinity for nerve tissue and nerve endings. The action of the drug and reaction of the tissues injected is somewhat dependent upon several factors. First, the strength of the solution, since the tissue fluids tend to dilute the anesthetic solution as diffusion takes place, thus limiting the extent of action. Second, the kind of solution. Braun⁴ has clearly demonstrated, (a) that the injection of sterile water into the tissues is a painful procedure followed by local anesthesia of very short duration, the tissues remaining infiltrated for some

hours; (b) that the injection of an isotonic solution (normal saline) would not irritate nor produce a lasting infiltration of the injected tissues nor would any anesthesia result, thus proving that satisfactory anesthesia is produced by the direct action of the anesthetic agent, and is not due to infiltration of the tissues, and also that it is of great advantage to dissolve the anesthetic agent in an isotonic solution such as normal saline, Ringer's solution, or, as is quite generally recommended, a .5% saline solution. (Our tests confirm this.) The fact that these anesthetic solutions in themselves have a tendency to produce an isotonic solution is of little importance when using weak solutions. At least this is known to be true for cocaine, since Braun⁴ states that it would require a 5.8% solution of cocaine in sterile water to produce an isotonic solution.

It is furthermore known to be of assistance to the action of the local anesthetic solution to add five drops of a 1-1000 adrenalin solution to each hundred cubic centimeters of whatever strength solution is to be used. This tends to delay absorption of the solution, and thereby not only prolongs its action but further lessens the liability of a general toxic effect of the drug. Another important reason for the addition of adrenalin is its power to diminish capillary hemorrhage in the injected area.

2. *Anatomy.* All recent authorities upon the subject of local anesthesia stress the importance of being nerve anatomists, and this seems entirely plausible. For nerve-blocking or conduction anesthesia, one must know not only what nerves supply the region to be anesthetized but also the course and relative position of the nerve trunk, in order that the solution may be placed in actual contact with the nerve. For this purpose we use a 2% solution of the anesthetic agent.

For terminal or infiltration anesthesia one must know what structures are sensitive, in order to know how to inject a region effectively. For example, the skin, nerve trunks, blood vessels, periosteum, synovial membranes, parietal peritoneum and mucous membranes near the orifices are all sensitive structures, while subcutem, fat, muscles, tendons, fascia, bone, cartilage and visceral peritoneum are considered insensitive structures, except where nerve trunks or blood vessels are present. In abdominal surgery one must not disregard such sensitive points as the broad ligament, the ovarian pedicle and the mesentery. For terminal anesthesia, we use a .5% solution of the anesthetic agent.

Diffusion anesthesia, as we have already noted, depends to a great extent upon the strength of the solution employed. However, we must realize that fascia is a formidable barrier, and that solutions injected subcutaneously, for example, diffuse in the non-sensitive, loose, subcutaneous tissues without producing the desired result either in the overlying skin or in deeper structures. Thus we see the importance of injecting individually the *sensitive* layers to be invaded, and avoid wasting time and material on non-sensitive structures. Where one depends upon the diffusion method, he must wait a variable length of time before beginning the operation.

(The above was shown to be true by one of the authors, both by practical test with the knife and by using a colored solution and then observing the extent of diffusion.)

3. *Instruments.* The instruments necessary for this work are very important, since failure and unreliable results follow attempts along this line when not properly equipped. The syringe should be in perfect working order, one that can be easily sterilized and can always be depended upon to make injections into the tissues under a reasonable amount of pressure. We prefer a 10-cc syringe with a short, glass barrel. A proper needle is one of the most valuable assets in perfecting the technique of this operation. It must be fine-gauged, rather flexible yet durable. For our work, we are using the 505 N. Champion veterinary needle, 22-gauge, one- and two-inch lengths, made by Becton, Dickinson & Company, Rutherford, New Jersey. In some areas where the skin is especially hard to inject, as that of the ox, or the top of the neck, poll and withers of the horse, a one-inch needle is preferable.

4. *Technique.* First, establish an insensitive *wheel in the skin* by placing the point of the needle simply within the epiderm, and inject a small quantity of anesthetic solution as the needle is inserted into the deeper layers of the skin, thereby anesthetizing ahead of the needle. A bleb, or so-called wheel, will be noted in the skin, varying in size according to the extent of the injection. This serves as an insensitive point from which further injections may be made. It is usually advisable to apply the twitch in making the primary injection.

For deep injections, we determine approximately the location of the point of the needle by paying close attention to variations in the resistance of fascial layers and other tissues. If, in the course of an operation, such as scrotal or umbilical hernia, for

example, we find that the parietal peritoneum or hernial sac is not anesthetized, it takes but a very few seconds to inject around the neck of the sac before proceeding further. Poll evils, shoulder tumors and tumors of all kinds may be handled in like manner. However, in these cases one usually finds the primary injection sufficient.

For all ordinary operations we find the skin injection to be the most important part of the procedure, since the skin is usually the most sensitive structure with which we deal. The skin injection is made *intracutaneously* in the following manner:



Fig. 1. Operative field blocked by intracutaneous injection of the anesthetic solution.

With the point of the needle inserted into the skin, a small amount of solution is injected, producing the so-called wheal. Holding the needle parallel with the surface of the skin, it is now ready to be advanced. A little pressure on the plunger of the syringe forces the solution ahead of the needle, separating the layers of the skin and causing an elevation upon the surface. The point of the needle is thus caused to follow the solution, and thereby the injection is rendered painless. It is important to notice this elevation upon the surface

(fig. 1). In making an incision for deep-seated abscesses, etc., the intended line of incision only may be injected, since these edges will not be united by sutures. It might be considered better technique in some operations if the area to be incised is encircled by the injection rather than making a single injection in the direct line of incision (figs. 2 and 3). Thus, the incision is not made into the infiltrated skin.

In certain operations, as fistula of the withers, where the bone and very deep tissues may be invaded rather extensively, we recommend the preliminary administration of about *two ounces*

of *chloral hydrate solution* directly into the stomach by means of the stomach tube. We find local anesthesia alone, or in combination with chloral hydrate, in special cases, to be very practical, and it has eliminated to a great extent the use of general anesthesia in our practice. If the skin is properly injected, it remains anesthetized for at least forty-five minutes.



Fig. 2. Shows operation in progress within the area. Notice that the animal shows no reaction.

Acutely inflamed tissues are hypersensitive, and results have not been satisfactory when injections were made directly into such tissues. We have not been successful in the use of local anesthetics for the removal of large scirrhus cords in pigs, and, since learning Dr. C. E. Juhl's method of passing the stomach tube, we much prefer the use of chloral hydrate in these cases.

TECHNIQUE FOR SPECIAL REGIONS

1. *Dental Anesthesia.* Since 1915 "nerve-blocking" or con-



Fig. 3. Completing the operation. No restraint has been necessary at any time.

and incisor teeth. The dental branches of the mandibular nerve (fig. 4) are detached from the nerve within the mandible, and are arranged like the corresponding nerves of the upper jaw." (Sisson.)

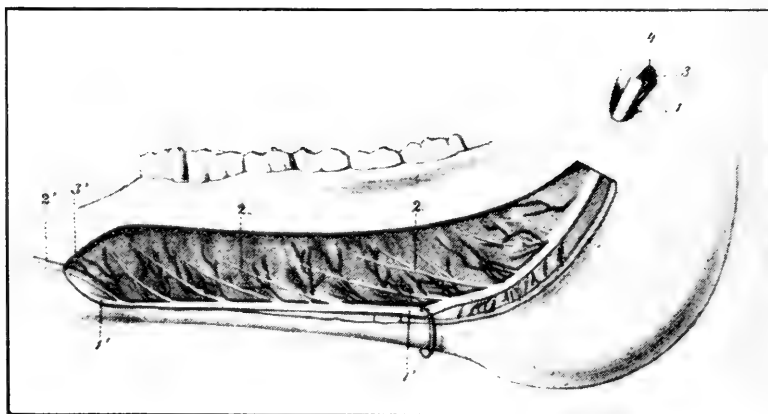


Fig. 4. Part of branch of lower jaw of horse; medial view. The bone has been removed to show the vessels and nerves. 1, 1', Mandibular alveolar nerve; 2, 2', branches to cheek and gums; 3, 3', branch to canine and incisor teeth; 4, 4', alveolar artery; satellite vein. (After Leisner's Atlas.)

ductive anesthesia of either the entire infra-orbital nerve or the mandibular alveolar nerve, as may be desired, has been used during dental operations in horses. "The infra-orbital nerve gives off alveolar or dental branches. The posterior branches pass through small foramina in the tuber maxillare and supply the posterior molar teeth and maxillary sinus. The middle branches are given off in the infra-orbital canal, and constitute the chief nerve supply to the cheek teeth and the maxillary sinus. The anterior branches supply the canine

The object of the operation is to inject directly upon the infra-orbital nerve, or the mandibular alveolar nerve, as the case may be, a sufficient amount of anesthetic fluid to "block" the sensation of these nerves at the points where they enter, respectively, the maxillary foramen and the mandibular foramen. For this purpose it is necessary to be provided with a hypodermic syringe and a 22-gauge needle about 10 cm in length.

For injection of the infra-orbital nerve, select a point on the side of the face opposite the lateral canthus of eye and just inferior to the facial crest, being careful to keep above the

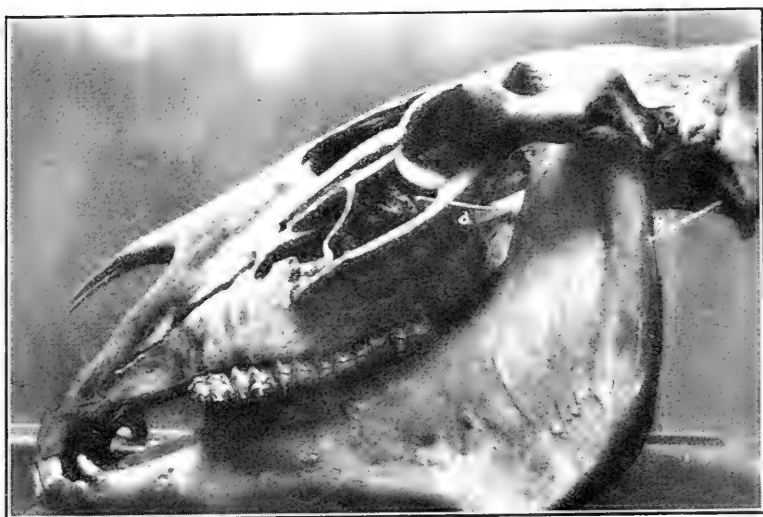


Fig. 5. (a) Shows course and relation of needle passed into the pterygo-palatine fossa, to reach the infraorbital nerve. (b) Shows position of needle to reach the mandibular alveolar nerve.

transverse facial vessels. The field being carefully shaved and painted with tincture of iodine, penetrate the skin with the sterilized needle, keeping the point directed medially and slightly anteriorly, so that it will pass ventral to the border of the zygomatic process and drop into the pterygopalatine fossa just posterior to the maxillary tuberosity (figs. 5 and 6). Push the needle in until it strikes the perpendicular portion of the palatine bone in the region of the maxillary foramen, a depth of 6.5 to 7.5 cm depending upon the size of the animal. Following this technique, it is possible to avoid puncture of the vena reflexa, which lies just posterior to the point of injection. Having placed the needle, inject 4 to 5 cc of a 2% solution of the anes-

thetic fluid. Withdraw the needle slightly as the injection proceeds. Anesthesia should be established after ten to twelve minutes, and should last twenty to thirty minutes after being established. We have tried blocking the nerve by introducing the needle into the canal through the infra-orbital foramen, as suggested by Dr. L. A. Merillat and others, but have not had as good results. We believe this to be due to the interference with distribution of the fluid offered by the connective tissue within the canal.

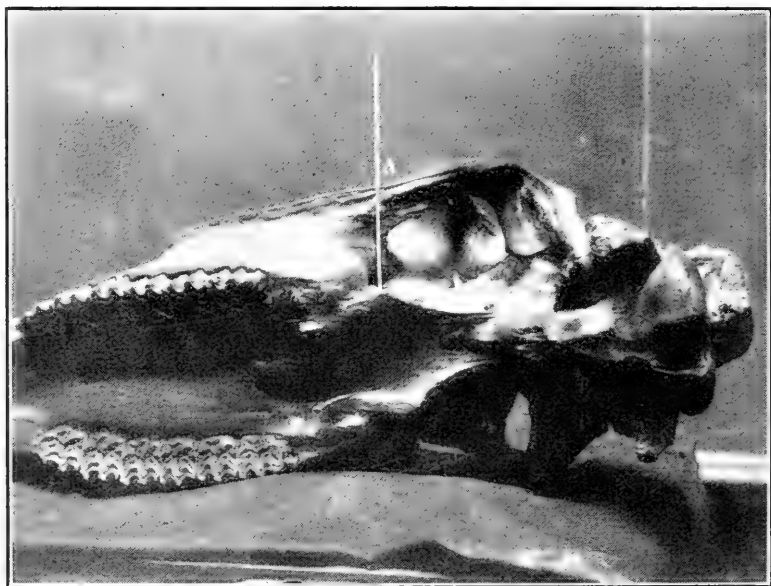


Fig. 6. (a) Shows depth to which needle must penetrate to reach the infraorbital nerve.

The injection of the mandibular alveolar nerve is a more difficult matter. Possibly a better technique may be devised later. The mandibular foramen lies practically opposite the point of intersection of a line dropped from the lateral canthus of the eye to meet a line extended backward from the plane of the table surfaces of the mandibular teeth (fig. 7). These structures can be palpated from the outside, and the approximate location of the foramen determined for the guidance of the needle in direction and depth. To reach the nerve after our present method, select a point on the posterior border of the mandible about 3 cm below the temporo-mandibular articu-

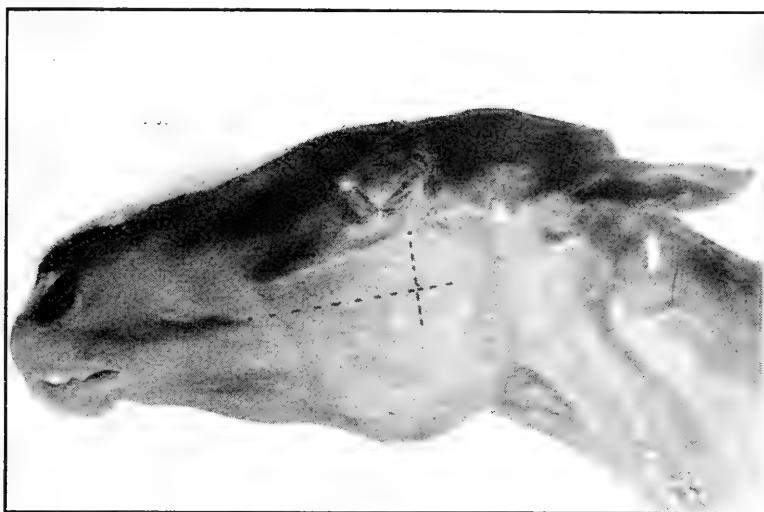


Fig. 7 Lateral view showing position of needles for blocking nerves.

lation. After thorough preparation, penetrate the skin at this point, and allow the needle to lie in the depression between the wing of the atlas and the base of the ear. Depress the point of the needle until it passes by the medial border of the mandible. Advance the needle to the depth and in the direction of the point of intersection of the above-mentioned lines, keeping the point as close as possible to the medial surface of the mandible, but, as the nerve lies medial to the accompanying artery and vein, the needle does not need to follow the bone

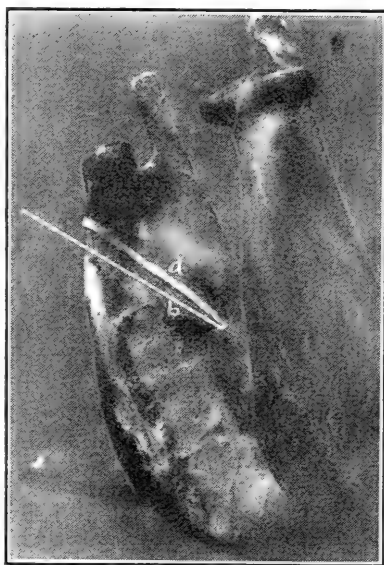


Fig. 8. (a) Shows approximate course of mandibular alveolar nerve. (b) Shows relation and direction of the needle to reach the mandibular foramen.

closely (fig. 8). Following this method, the needle should parallel the nerve for a distance of 3 to 4 cm. Distribute 4 to 6 cc of a 2% solution of the anesthetic fluid along this length,

and a good anesthesia should result.

2. *Quittors and Other Painful Foot Operations.* After thoroughly preparing the field over the course of the plantar or volar nerve, we first establish an insensitive wheal by an intradermal injection of a small amount of solution. From this insensitive wheal we then advance the needle, which should always be detached from the syringe, to the approximate location of the nerve trunk. We now inject about 2 cc of a 2% solution. If one is successful in applying the solution near the nerve and between the same fascial layers which contain same, a successful anesthesia will be obtained. The foregoing sentence may explain negative results often obtained when attempting to use local anesthesia for diagnostic purposes.

3. *Ring-bone.* The same procedure as described for the quittor may be employed, or, if the ring-bone is small, one may encircle the process by an intracutaneous infiltration of the skin and make deeper injections reaching the periosteum.

4. *Tenotomy of flexor perforans.* The intended field of operation having been thoroughly prepared, an intracutaneous injection along the line of incision, together with a small amount of a solution injected deeply into the field of operation anterior to the deep flexor tendon, will successfully relieve all pain for this operation.

5. *Spavins.* Here the same method of procedure as given in the second method for ring-bone may be employed.

6. *Fistula of the withers.* We first make an intracutaneous injection over the top of the withers longitudinally along the line of intended incision. We then make an intracutaneous injection along the side of the neck, encircling the field of operation for lowest point of drainage, namely, just in front of the anterior border of the scapula and at the inferior border of the rhomboideus muscle (fig. 9). We find that these two injections are usually all that are required in the majority of fistula operations, since the skin in these regions is practically the only sensitive structure invaded for simple drainage of the process. Where rather extensive operating is anticipated, we previously administer two ounces of chloral hydrate dissolved in a quart of warm water, and given twenty to thirty minutes prior to operation directly into the stomach by the use of the stomach tube. We very rarely resort to chloroform for such operations.

7. *Poll Evil.* The area having been thoroughly prepared, the intended line of incision in the median plane is intracutaneously

infiltrated with a $\frac{1}{2}$ per cent solution. Through this insensitive line we make deeper injections, particularly in contact with the periosteum on the posterior surface of the occipital tuberosity. In most all cases where the pathology is confined to the bursa in the form of a serous bursitis, the above method of injection proves adequate. Where there is considerable acute inflammation present, due to extensive phlegmonous parabursitis, the pre-

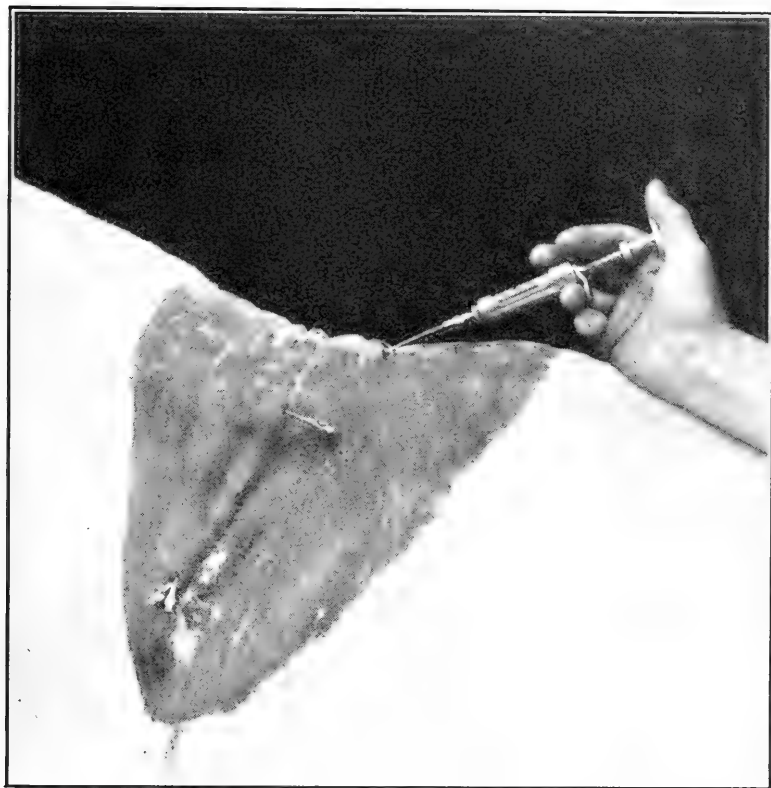


Fig. 9. Showing field of operation and method of injecting.

liminary administration of chloral hydrate, as recommended under fistula of the withers, will prove likewise to be adequate.

8. *Shoulder tumors (galls and abscesses).* For removing these processes, one should first encircle the process by an intracutaneous injection of a $\frac{1}{2}$ per cent solution, and then make deep injections from several points around the process with a long needle in such a manner that the deepest points of the

many injections will be at, or near, the same point under the process.

9. *Tumors.* Tumors of all kinds, including infectious breast tumors of swine, may be successfully removed following the same technique as given in 8, providing the processes are not so extensive as to make successful injection impossible.

10. *Umbilical hernia.** The intended field of operation is encircled by an intracutaneous injection of a $\frac{1}{2}$ per cent solution in the usual manner. Where such injections include a rather large isolated area, a small amount of solution is injected subcutaneously also, in order to block any sensory nerves that might approach the isolated skin subcutaneously. Deeper injections are now made around the neck of the sac at the hernial ring. After isolating the hernial sac and before attempting to suture, we anesthetize the peritoneum around the hernial ring by passing the needle between the abdominal floor and the parietal peritoneum, directing the needle with one finger inside the abdominal cavity, and thus we inject a $\frac{1}{2}$ per cent solution completely around the ring. This makes it possible to suture through the peritoneum without any sign of pain. The only objection to the use of local anesthesia in such operations is the fact that occasionally pigs struggle under confinement without any indication of pain. However, the struggling tends to force the abdominal content into the hernial sac, which interferes with operative procedure. Personally, we have not found this to happen often enough to be a serious handicap. Chloral hydrate per os is the preferred anesthetic when local anesthesia is not used.

11. *Inguinal hernias.* Here a triangular area of skin is isolated by an intracutaneous injection of a $\frac{1}{2}$ per cent solution directly over the inguinal ring and canal, with the base of the triangle just anterior and parallel to the anterior margin of the ring and the apex extending well back toward the scrotum. The tunica vaginalis proprius having been exposed by incision, we now inject 5 to 10 cc of a 1 per cent solution directly into the vaginal sac. We also inject a small quantity into the subperitoneal tissue immediately surrounding the inguinal ring.

12. *Castration.* We have been able to demonstrate convincingly that this operation can be performed painlessly by a comparatively simple method of applying local anesthesia. The intracutaneous injections are made in the usual manner at two

*See article on Umbilical Hernia in the Pig—Practitioners' Short Course Bulletin, 1923.

points, (a) along the intended line of incision and (b) at the point of attachment of the scrotal ligament. Deeper injections are also made at this latter point and immediately around the cord anteriorly. After exposing the testicle and cord within the tunic, we now instill 5 to 10 cc of a 1 per cent solution into the sac formed by the tunic. In this way the solution is in contact with the structures of the cord as far forward as the inguinal ring. We have used this method to our entire satisfaction on both the pig and the dog, and less satisfactorily in the horse, but hope to perfect our technique so as to make its application fully satisfactory in this species as well.

13. Cesarean section of the sow. An intracutaneous injection is made in the usual manner along the line of incision. It is also advisable to infiltrate the tissues underlying the skin, layer by layer, down to the parietal peritoneum. Since anesthesia is instantaneous, we can more accurately inject some of the deeper layers as we proceed with the operation.*

14. Spaying heifers. Here we use exactly the same technique as recommended in the first part of 13.

15. Rumenotomy. Same as 13.

16. Teat operation. Here we infiltrate the skin and tissues around the field of operation much the same as in removing tumors. In case of rather extensive operation, we may block the entire teat by injecting thoroughly around the base. In addition to this, where one is operating inside the milk canal, one may instill a few cubic centimeters of a 2 per cent solution directly into the canal and wait a few minutes for surface anesthesia.

17. Tail amputations—horse and dog. Local anesthesia of the tail of the horse in preparation for amputation is difficult, on account of the curvature of the surface and the thickness and tenseness of the skin. The injection should be made intracutaneously at a large number of points encircling the tail, above the point of operation. The deeper layers are infiltrated and a few cubic centimeters placed deeply at the point of disarticulation. This same technique gives perfect satisfaction in the dog.

18. Accidental wounds. The use of local anesthetics, properly injected, greatly facilitates the handling of these cases, and very materially leads to better work, better results and more satisfaction to both operator and client.

*It has been our usual practice in this operation to use chloral hydrate alone, and when this is insufficient, give a small amount of chloroform in addition.

19. *Ablation of the eye.* The lids and conjunctiva can be blocked in the usual manner and the tissues surrounding the orbit infiltrated by points deeply placed. Where the tissues are acutely inflamed at the time of operation, satisfactory anesthesia has not always been obtained, but we believe this to be due to lack of proper technique, which needs to be further worked out.

SURFACE ANESTHESIA

Mention has already been made of the application of 1 and 2 per cent solutions to serous and mucous surfaces, namely, the tunica vaginalis surrounding the spermatic cord and the mucous membrane lining the teat canal. For operations upon the surface of the eye, we first instill a few drops of a 2 per cent solution of butyn upon the cornea and conjunctiva. After a few minutes, a second instillation is made. This makes it possible to perform minor operations, such as the removal of foreign bodies from the cornea and conjunctiva, cauterization of the cornea, etc. When employing cocain for this purpose, we use a 4 per cent solution, and it is necessary to keep the surface of the eye moist with saline solution because of the desiccating effect of cocaine.

The tympanum of the ear is best anesthetized by the use of a few drops of Bonain's solution, consisting of:

Phenol,
Menthol,
Cocain hydrochloride aa.

These crystals when rubbed together make a syrupy liquid. A small pledget of cotton, secured to the end of a flexible instrument, is used to carry a few drops of this liquid in contact with the tympanum, where it is held for about five minutes.*

SEDATIVES AND HYPNOTICS USED AS GENERAL ANESTHETICS†

1. *Chloral hydrate.* We employ chloral hydrate quite frequently for the horse, pig and ox, and find it quite applicable in the conditions enumerated below. In all three species our method of administration is practically the same. If possible, we prefer to have the patient starved out at least twelve to twenty-four hours prior to administering the chloral, and find that our

*See article on Otitis Media in April number of this Journal, 1923.

†Under this heading we are giving a brief discussion of chloral hydrate and morphin only. While we employ these products and feel that they answer a need at the present time, we believe that their use may be greatly limited in the future as we become more familiar with anesthetics and their application.

results are more uniform. We also find it to be an advantage to have the chloral dissolved in warm water immediately before it is administered. The amount of chloral used depends upon the species and weight. For horses weighing a thousand pounds and over, an ounce and a half to two ounces, dissolved in a quart of *warm* water, is administered directly into the stomach by way of the stomach-tube. In this way there is no loss of material, and we believe by withholding feed prior to the administration that absorption is more rapid and the results more uniform. The usual time required following the administration, before a proper state for procedure is reached, is twenty to thirty minutes. We recommend its use in the horse only when used in conjunction with local anesthetics, as suggested under the discussion of fistula and poll evil, or alone in such operations as ovariectomy and oftentimes in comparatively simple operations where the animal is quite irritable and hard to control. We sometimes use it preliminary to putting horses upon the operating table or to casting certain fractious individuals in order to avoid injury and lessen labor.

In the ox, if mature, we use from one to two ounces of chloral, dissolved in a quart of warm water, which may be administered directly into the stomach by the use of the stomach-tube or given as a drench. Its action is very good in this species, and if such administration is supplemented where necessary by the the administration of a small amount of chloroform, suitable anesthesia is obtained for most all practical purposes.

In the pig, we have used chloral hydrate very extensively, and feel that we can highly recommend it for practically all operations where general anesthesia is indicated. We administer it directly into the stomach, according to Dr. C. E. Juhl's method of medicating swine, using his technique for passing the stomach-tube. We have kept accurate records on a large number of pigs, particularly in regard to the weight of the pig and the amount of chloral hydrate used. We found that by using three drams of chloral hydrate per fifty pounds of body weight that satisfactory general anesthesia was obtained in four-fifths of the subjects, after waiting twenty to thirty minutes for the chloral to act.

Our maximum dose for hogs has been two and a half ounces of chloral hydrate, dissolved in one quart of warm water. The amount of water used varies with the amount of chloral hydrate. If after waiting thirty minutes a state of surgical anesthesia

has not been reached, as was the case in one-fifth of our subjects, it requires but very few inhalations of chloroform to produce the desired state. The chloroform may then be removed and anesthesia is maintained. We have found in a number of these cases which did not respond quite satisfactorily at the usual time, that they would reach the desired state of anesthesia at the end of forty-five minutes to one hour. Perhaps this variation may be due to the variation in the stomach content. Chloral hydrate is used by us for such operations as removing scirrhus cords, extensive breast tumors in the sow, and in operating umbilical and scrotal hernias in pigs.

2. *Morphin sulphate.* We have been using morphin in the dog over a period of several years, and have found it very satisfactory, except where we have unfortunately secured a product of low potency. Especially do we prefer morphin where a prolonged anesthesia is desired, that is, where it is desirable to keep the patient quiet for some time following an operation. Other factors in its favor are, the ease with which it is administered, its promptness in producing its effect and the safety with which it can be employed.

Owing to the constipating effect of the drug, the patient is prepared by withholding feed for twenty-four hours prior to administration and until the day following. In addition the patient is given a purgative dose of castor oil at the beginning of the period of fasting.

The morphin is given subcutaneously, the dosage varying from $\frac{1}{2}$ to 3 grains, depending principally upon the size of the animal. Much larger doses can be given safely, but the above dosage has proved sufficient.

A few minutes following administration the animal shows nausea and vomiting, and in fifteen to thirty minutes anesthesia is sufficiently advanced to render surgical procedure practically painless. Where it seems advisable to prevent nausea and vomiting, or where the respiratory act indicates that the depressant effect of the morphin upon the respiratory center might prove detrimental, we combine atropin with the morphin, giving from 1/80- to 1/10-grain doses.

Lately we have experienced considerable difficulty in securing morphin sufficiently potent to insure results. This makes the determination of proper dosage extremely difficult, and leads in many cases to unsatisfactory anesthesia.

We have found upon inquiry that a great many veterinarians

have had this same experience, and that some of them have discontinued the use of the drug entirely, feeling that if ether or chloroform might possibly be needed to finish the anesthesia, one of them should be depended upon entirely.

GENERAL ANESTHESIA

1. *Chloroform.* Where a complete relaxation of muscles and a state of general anesthesia is desired, chloroform undoubtedly stands out as the foremost agent for both the horse and the ox. We have used it for a number of years, and feel justified in fearlessly recommending it as a safe procedure, when properly given. However, in general practice, it is applicable only in the warm months of the year, unless one is equipped with a well heated hospital.

GENERAL EXAMINATION OF THE PATIENT

Before resorting to the use of general anesthesia, the patient should be carefully examined to determine the frequency and character of the pulse and respiration, fullness of the digestive tract and stage of pregnancy, if pregnant. Also the presence of any wounds, paralysis or unsoundnesses, which, if not noticed and the owner's attention called to their presence, may later be laid at the door of the operator. Respiratory and circulatory diseases, general debility and generalized septic conditions offer the chief contraindications. Any irregularity noticed may lead to the selection of a different form of anesthesia, or the dangers should be stated to the owner before operating.

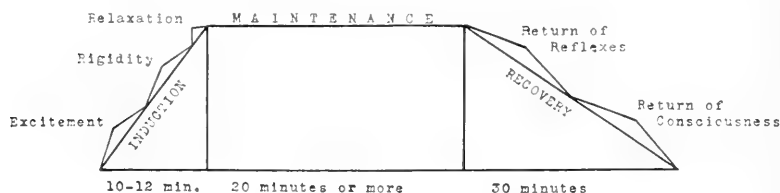
It is of the utmost importance that the chloroform should be fresh and not have been exposed to sunlight or heat. It should be used from the original container. Any chloroform left over from a previous operation the day before should be discarded for purposes of anesthesia. For this reason we recommend that it be purchased in not larger than one-quarter-pound bottles.

TECHNIQUE AND DISCUSSION OF ADMINISTRATION

The patient should be comfortably confined, and inconvenienced as little as possible.

Position of head. The head should rest in a perfectly natural position, since if flexed to any degree stertor and obstructed breathing will result, while extension deprives the larynx of its natural protection, thus rendering swallowing difficult or impossible and exposing the larynx to the entrance of mucous or foreign substances. We do not lay a great deal of stress upon

dieting the patient, though, if possible, withhold the feed for about twelve hours previous to operation. This is perhaps more important in fat and vigorous individuals. According to Flagg¹, complete general anesthesia is divided into three distinct stages, namely, the stage of induction, the stage of maintenance and the stage of recovery. These three stages are further divided, as follows: The stage of induction into (a) the period of excitement, cerebral and muscular, (b) the period of rigidity and (c) the period of relaxation. The stage of maintenance is not divided. The stage of recovery is divided into two periods, (a) the return of reflexes, (b) the return of consciousness. (See chart.)



This method of charting the curve of complete anesthesia seems quite practical and applicable to chloroform anesthesia of the horse.

First, the induction. We prefer the open method of administering chloroform by the use of toweling placed over the upper nostril through which the chloroform is to be inhaled, the number of thicknesses, varying from time to time, depending upon the concentration desired. We find that results are best where the least amount of excitement is encountered, since this induces struggling, which, in turn, by causing deep, rapid breathing, tends to produce a condition known as acapnia, which may be followed by apnoea. This is one of the conditions known as primary shock and may be easily avoided, and will not result seriously, providing the anesthetic is removed and the patient allowed to recover. However, if the anesthetist continues to administer chloroform, the toweling becomes saturated, and, when the patient again breathes deeply, the concentrated vapor may cause cardiac syncope, respiratory syncope, or both. We find that the period of excitement can be reduced to a minimum by observing the following procedure: The upper nostril having been lubricated with vaselin, a single thickness of toweling is placed loosely over this nostril. A few drops of

chloroform are then dropped upon the toweling at such intervals as the individual indicates a growing tolerance for same. In this manner the patient becomes accustomed to the fumes of chloroform; the irritation to the sensory nerve-endings in the respiratory mucous membrane is reduced to a minimum, and thereby excitement and struggling are practically eliminated. As soon as practicable, the lower nostril is completely plugged, and an assistant takes a firm grasp upon the lips on either side of the mouth, so as to prevent any possible intake of air by way of the oral cavity. This we believe to be absolutely essential to successful induction. The patient is now quite accustomed to the fumes of chloroform, and we therefore gradually increase the number of thicknesses of toweling and the quantity of chloroform given until we reach four to six thicknesses of toweling and are dropping on several drops of chloroform at each inspiration.

The stage of rigidity will not concern us much, unless caused by prolonged excitement from any cause, such as (1) obstructed respirations, (2) interference with the patient, such as attempts to prepare the field of operation or unnecessary interference by bystanders, or (3) beginning the operation before the stage of anesthesia has been reached. We disagree with Brumley,⁹ Saunders,¹⁰ and others, who prefer a slow induction period covering fifteen to thirty minutes. We believe, that after carefully leading up to a maximum administration, that it is safer and much more satisfactory to push the anesthetic until surgical anesthesia or the stage of maintenance is reached. Following this procedure, relaxation is usually reached in eight to ten minutes, and the maintenance stage in ten to twelve minutes from the beginning of administration. At this point the administration is reduced to the minimum, which varies for different individuals, and this minimum is maintained throughout the maintenance stage.

If one proceeds slowly with the administration of chloroform, the patient suffers more excitement and struggling and the undesirable consequences that accompany such. Also, a greater amount of chloroform is required to produce complete anesthesia. Any of the foregoing conditions or circumstances which tend to produce struggling and deep breathing for any length of time will cause an accumulation of oxygen in the blood, with a proportionate diminution of carbon dioxide content (acapnia). Carbon dioxide is the excitant of respiration, and

general anesthesia depresses the respiratory center, which therefore needs increased carbon dioxide stimulation in order to maintain adequate respiration. By pushing the anesthetic, as above recommended, a certain amount of rebreathing is induced, and thus the carbon dioxide content of the blood is raised (hypercapnia). The condition of the patient is more pliable than where there is a tendency for apnoea from acapnia.

During the induction of chloroform, we watch very carefully the respiratory movements, the pupil of the eye, the corneal reflexes, and the pulse. The respirations at first tend to be rapid and shallow, but soon become more regular, slower, deep and full, and should continue so throughout. The pupil at first dilates, but soon contracts, and remains about the same throughout the maintenance stage unless, due to narcosis, it is noticed to dilate suddenly. However, if one is watching the respiratory movements carefully, such a stage of narcosis will not be reached. The eyelids are widely dilated until the stage of relaxation is reached, at which time the lids become droopy, and, if passively closed, tend to remain in that position. During the stage of rigidity, the eyeball oscillates considerably, and during the latter stage of induction the animal may attempt to neigh. The most highly organized centers of the brain, namely, the cerebral centers, are the first to succumb to the action of chloroform, while the vital centers in the medulla and the lower reflexes controlled by the cord are only affected in case of intoxication. Thus we see that all parts of the body are not affected to the same degree by general anesthetics. A loss of consciousness, suspension of central and spinal sensory and motor impulses, constitutes what we generally term surgical anesthesia.

The corneal reflexes may be used as an index to the stage of anesthesia, since they disappear about the time the maintenance period is reached, which is long before the danger point would be reached in case the anesthetic should be pushed too far. We do not make a practice of constantly testing the corneal reflexes, since it is irritating to the eye and considered unnecessary. The corneal reflex disappears soon after the relaxation and drooping of the eyelids, and if it is desired to test these reflexes they can be tested at this stage.

The heart action becomes accelerated, due to central depression of the inhibitory mechanism, but the pulse should remain full and strong. For reasons already mentioned, the operation

should not begin until the patient is in the state of complete anesthesia. Highly inflamed tissues retain sensibility longer than normal tissues, and therefore a little deeper anesthesia is required when operating upon these tissues. All patients should be maintained in the proper state of anesthesia with the least possible amount of anesthetic agent. This requires a careful study of each individual patient by the anesthetist. At the close of the maintenance stage, the animal should be permitted to recover naturally, and not forced to assume a standing position before it has sufficiently regained consciousness and muscular control. The time required for recovery will vary with different individuals, according to the time and depth of anesthesia. Ordinarily, an animal will recover in about thirty minutes. However, feed and water are withheld at least ten to twelve hours following general anesthesia.

2. *Ether.* We sometimes employ ether as a general anesthetic in the dog, and rely upon it entirely for anesthesia in the cat. We feel that there is practically no danger from ether as an anesthetic in these animals, if properly administered. The general principles as laid down for the use of chloroform are observed in using ether. The period of induction is made as short as possible, and especially is this desirable in the cat, owing to the peculiar susceptibility of the cat to drugs. The method of administration consists in placing a small amount of cotton saturated with one to two drams of ether in the bottom of a conical graduate or anesthesia cone. This is then placed over the nose and mouth of the animal, which has previously been confined on the operating table or in some other suitable manner. There is a short period of struggling, but in from three to ten minutes anesthesia is established and the ether is removed temporarily and administered thereafter as the occasion demands.

The anesthetist should carefully watch the respirations, as the rate and character of these are the safety valves in anesthesia.

Where the anesthesia has been pushed too far, or where asphyxia threatens from any cause, the ether should be removed at once. Plenty of fresh air should be allowed, and artificial respirations established at once. Inhalations of ammonia are also serviceable.

SHOCK

In considering intoxication and collapse, we believe that too

much emphasis has been placed on the drug and not a sufficient amount of responsibility placed upon the surgeon. We have elsewhere disposed of primary shock. According to Robinson,² "Secondary shock is accentuated by administration of anesthetics, but is not relieved by cessation of the anesthetic. The failure of the circulation is due to diminution of the volume of blood in the circulation, and therefore heart stimulants are useless." Adrenalin and pituitrin, which cause constriction of the arterioles, are also useless. Strychnin, which has a purely central action, is, of course, completely useless in this condition, as was shown twenty years ago by Crile.

Primary and secondary shock have been confused in the past, and hence numerous drugs, which do good in the less serious condition of primary shock, have been recommended for the far more serious condition of secondary shock, for which they are unsuitable. Crile performed a long series of experiments on mammals, and showed that violent sensory stimulation, and particularly injury of the viscera, produce a progressive fall of blood pressure due to exhaustion of the vaso-motor center.

The cause of secondary shock appears to be a poisoning of the body with some substance with a histamin-like action that is produced when tissues are injured. It is considered, therefore, that secondary shock is produced primarily by a tissue injury, and is made worse by hemorrhage, cold, massage, or movement of the injured parts. The prevention of shock, therefore, very largely rests with the surgeon's ability to handle all tissues during operation so carefully that the least possible amount of injury is incurred. Extensive, clean-cut incisions and dissections properly cared for are not so injurious or apt to produce shock, as rough manipulation of tissues and organs where the incisions are much less extensive in comparison.

Once shock is established it is difficult to treat, but the chief form of treatment is the restoring of the lost plasma of the circulation. Intravenous injections of normal saline solution produce an immediate beneficial effect, but the action is very transient, because it is very rapidly excreted by the kidneys. Intravenous injections of normal saline in 6 per cent gum arabic, as recommended by Sir W. Bayliss, produce much more favorable effects, and the beneficial effect is more prolonged. In human surgery the transfusion of blood, if possible, is most efficacious.

In the treatment and prevention of further shock, Crile⁶ lays particular emphasis upon the following points:

First, checking of hemorrhage.

Second, relieving pain, and for this purpose he recommends morphin as the "surgeon's sheet-anchor."

Third, blood transfusion; since the blood can only temporarily be diluted with saline solution.

Thus we see the advantage and possibility of preventing shock in surgery rather than attempting its treatment as a complication. We arduously advocate the development and application of more perfect technique in veterinary surgery, and are firm in the belief that the successful application of anesthetics is one of the first important steps in attaining this goal.

BIBLIOGRAPHY

¹Flagg: Art of Anaesthesia.

²Hewitt: Anesthetics and Their Administration

³Allen: Local Anesthesia.

⁴Brown-Shields: Local Anesthesia.

⁵Labat: Regional Anesthesia—Its Technical and Clinical Application.

⁶Crile-Lower: Anoci-Association.

⁷Juhl: Use of the Stomach Tube in Swine—*Jour. A. V. M. A.*, lxiii, n.s. 16 (1), April, 1923.

⁸Sisson: Anatomy of Domestic Animals.

⁹Brumley: Surgical Anaesthesia—*Veterinary Alumni Quarterly*, Sept., 1914.

¹⁰Anesthesia—*Amer. Jour. Vet. Med.* xiv (12), Dec., 1919.

VETERINARY PRACTITIONERS' WEEK

The California State Veterinary Medical Association, in cooperation with the Division of Veterinary Science, of the University of California, has arranged a splendid program for Veterinary Practitioners' Week, at University Farm, Davis, Calif., January 7–10, 1924. Special lecturers who will assist in the program are: Dr. T. H. Ferguson, of Lake Geneva, Wis.; Dr. Maurice C. Hall, of Washington, D. C.; Dr. K. F. Meyer, of San Francisco; and Dr. W. Pfenninger, of the University of Zurich, Switzerland.

The course is open to all qualified veterinarians. No fees will be charged. The expense of the course will be paid by the College of Agriculture, of the University of California.

On December 13, a club was organized in Philadelphia, under the name of The Philadelphia Club for Horsemen. Its object is to promote horse interests. Several veterinarians of the city are taking an active interest in the work of the organization.

INJECTION OF CATTLE WITH B. TUBERCULOSIS (AVIAN) AND RESULTS OF SUBSEQUENT TUBER- CULIN TESTS¹

By CECIL ELDER and A. M. LEE

*Agricultural Experiment Station, University of Wyoming,
Laramie, Wyoming*

INTRODUCTION AND HISTORY

There has been considerable work done with tuberculosis of cattle with regard to its relationship to human infection. Comparatively little has been done on the transmission of the avian tubercle bacilli to cattle and it is along those lines that this paper is written.

Several workers such as Day,¹ Christiansen,² Mohler and Washburn,³ Bang,⁴ Hastings and Halpin,⁵ Dunne,⁶ and others have demonstrated and proved that swine may be infected with the avian tubercle bacillus

Several years ago Arloing⁷ stated that the avian form could infect mammals and that the human and bovine types will affect birds. At that time he thought the avian form was an atypical form of Koch's tubercle bacillus. We will not attempt to discuss this latter point here, but merely mention it. Koch and Rabinowitsch⁸ made the statement about 1908 or 1909 that the avian and mammalian tubercle bacilli are varieties of a single species while Weber and Bollinger⁹ said they were not the same organism. The latter workers believed at that time that there was little chance for infection of mammals with avian organisms.

In 1911 Giltner¹⁰ reported the feeding of twin calves about two weeks old with finely chopped organs of a tuberculous hen. This material was given in the milk. One calf died almost two months later but revealed no evidence of tubercular infection on post-mortem examination. Two months after feeding tuberculous material the remaining calf was given a subcutaneous tuberculin test, along with a healthy calf, and avian tuberculin was used. The experiment calf gave a good reaction but was not slaughtered at that time. De Jong¹¹ reported that avian tubercle bacilli can spontaneously infect man, ape, pig, bovine,

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

rabbit, rat and white mouse, while Schroeder¹² writes that the avian type lacks the power to serve as the cause of an epidemic or an epizootic occurrence of tuberculosis among mammals. In an article by Schalk¹³ the statement is made that a few calves have been infected experimentally. Biester,¹⁴ in work done in Illinois, reports that calves can be artificially infected by injecting macerated tuberculous organs of chickens, and that local lesions are produced by the injection of a pure culture of the mycobacterium of tuberculosis isolated from tuberculous chickens. Himmelberger and Bang have succeeded in infecting cattle with avian tubercle bacilli.



Fig. 1. Ten Head of Steers Used in the Experiment.

The experiment we are about to report upon was suggested to us as the result of some field observations made in Western Wyoming by state employes who were doing tuberculin testing. Several cases of the so-called skin form of tuberculosis were detected by the tuberculin test. From history that could be gathered, indications were that the skin form of the disease was being found upon farms and ranches where there was at the time, or had been, tuberculosis in the chickens. This immediately raised the questions: Can avian tubercle bacilli infect cattle? If so, will those cattle react to injections of ordinary bovine tuberculin? If they are infected, what is the relationship of this infection to the form of the disease that we ordinarily call the skin form of tuberculosis? It was with these objects in mind that the experiment was outlined.

PROCEDURE OF EXPERIMENT

Ten head of range yearling steers were used in the experiment. These animals were good, healthy, rather typical, range steers of our Western country except for the fact that they were a little off color from our usual white-faced steer. (Figure 1 shows the steers used and illustrates the type). This was taken at the close of the experiment.

These steers were all tuberculin tested and found to be free from tuberculosis by all of the three tests used, namely, the ophthalmic, intradermal and subcutaneous tests.

MATERIAL USED FOR INJECTION

It was found rather difficult to get virulent strains of the avian tubercle bacilli which were in pure culture. On November 18, two cultures which were pure and were virulent were received from the North Dakota Agricultural College. Subcultures were made onto glycerin-agar with a pH value of approximately 7.2. These were incubated and after being found to be pure cultures by microscopic examination they were washed off and made up into suspension with sterile water. From this suspension six experiment calves were injected on December 1, as is shown in table 1. Before injecting, an area was clipped, shaved, and disinfected with tincture of iodine. Every precaution was used to avoid outside infection.

TABLE 1. AMOUNTS INJECTED, WHERE AND HOW

Ear Tag No.	Seat of Injection	Kind of Injection	Amount of Injection	Approximate Number Organisms Injected
83	Post. upper portion left forearm	Intradermal	0.1 cc	28,800,000
92		Intradermal	0.2 cc	57,600,000
84		Subcutaneous	1.0 cc	288,000,000
85		Subcutaneous	2.0 cc	576,000,000
87		Intramuscular	2.0 cc	576,000,000
88		Intramuscular	1.0 cc	288,000,000
89	Not injected (Controls).			
91				
93				
81				

Note: Injections all made on December 1, 1922.

On the same date, from the same suspension, two healthy hens, nos. 1 and 11, were injected to prove the virulence, for chickens, of the cultures used in the cattle. The hens received the amounts shown in table 2.

TABLE 2—INJECTION OF HENS (VIRULENCE CONTROLS)

No. of Hen	Date Injected	Place of Injection	No. cc Injected	Approximate Number Organisms Injected
1	Dec. 1, 1922	Peritoneal Cavity	1.0 cc	288,000,000
11	Dec. 1, 1922	Peritoneal Cavity	0.5 cc	144,000,000

On February 19 both hens were given the intradermal test, avian tuberculin being used. At this time hen no. 1 was showing every symptom of acute tuberculosis. She was extremely emaciated, weighing only about one-third of her pre-injection weight. This hen showed no reaction to the tuberculin test. Hen no. 11 gave a good reaction, which showed us as a diffuse swelling of the wattle, which was hot and painful. Swelling began at the 24th hour following injection and still persisted at the 72nd hour following injection.

Hen no. 1 died and was autopsied on February 27. Examination revealed tubercular lesions throughout the abdominal cavity. Smears made from lesions in the liver, mesentery, intestinal wall, and skin, and stained by acid-fast method, revealed typical tubercle bacilli. Straight and curved rods, many of which were granular, were found and which had taken the acid-fast stain. On this date an emulsion was made from lesions in the liver and hen no. 111 injected, in order to retain organisms in a virulent form. At the time of injection of this hen no. 111 was very healthy, weighing $3\frac{3}{4}$ pounds. She was tuberculin tested and gave a negative reaction.

On May 31, hens nos. 11 and 111 were both tested with avian tuberculin. Hen no. 11 showed a slight swelling of the wattle. Hen no. 111 showed marked swelling of the wattle or a good reaction at the 24-hour period following injection. This reaction persisted for 96 hours.

On June 3, hen no. 11 died and showed tubercular lesions throughout the abdominal cavity. Figure 2 gives an idea of the extent and location of these lesions.

During the progress of the experiment the calves were kept in a large lot isolated from other live stock. They were fed and

watered once daily, as is customary under range conditions in the winter. All the calves wintered very well on hay ration alone, consisting of alfalfa and prairie or native hay.

The first of April, four months after being injected, the calves showed the following lesions at point of injection:

Ear Tag No. 84. Swelling approximately the size of a black walnut, noted at point of injection beneath the skin. On palpation swelling was found to be hard and movable.

Ear Tag No. 85. Swelling at point of injection very similar to that in calf No. 84 but slightly smaller in size.

Ear Tag No. 87. At point of injection swelling was noticed, apparently all in the subcutaneous tissue, about the size of an average pecan.



Fig. 2. Lesions Found in Hen No. 11.

Ear Tag No. 88. This calf received an intramuscular injection but showed no lesions at point of injection.

Ear Tag No. 83. Showed no lesions at point of injection.

Ear Tag No. 92. Showed no lesions at point of injection.

Other than local lesions noted above, animals were to all appearances in healthy condition, as were the four controls.

RESULTS OF TUBERCULIN TEST

It was decided to give all the animals, including the controls, three tuberculin tests, namely, the ophthalmic, intradermal, and subcutaneous. On May 5, the calves were given the intradermal injection, B. A. I. tuberculin being used. As it was

impossible at this time to obtain ophthalmic discs, intradermal tuberculin was used for the ophthalmic test. The sensitizing dose for this latter test was placed in the left eye at the same time the intradermal injections were made. As calves had been running free in the lot, they were turned loose and kept in their usual environment. Readings were taken at the end of twenty-four hours on the ophthalmic test for evidences of any irritation in the eyes. Both eyes in all calves showed normal.

At the end of the forty-eight-hour period, observations upon the eyes showed nothing. Readings were also taken at this time (forty-eight hours) on the intradermal test and three of the calves (nos. 84, 87 and 88, as is shown in table 3) began to show a suspicious reaction. On this date, May 7, calves were tied up during the day to accustom them to being tied. They were turned loose in the evening and caught again the following morning, on which date the diagnostic dose of intradermal tuberculin for the ophthalmic test was given. This diagnostic dose was given exactly seventy-two hours following the sensitizing dose. The two-hour readings on the ophthalmic test, taken over a period of eight hours, were all found to be negative in all the calves.

On the intradermal test, commencing at the forty-eight hour period, readings were taken every twenty-four hours up to and including the one hundred twentieth hour. Three of the

TABLE 3—RESULTS OF INTRADERMAL TEST (MAY 5)

Ear Tag No.	May 7 48-hour Reading	May 8 72-hour Reading	May 9 96-hour Reading	May 10 120-hour Reading	Results
83	N	N	N	N	Negative
92	N	N	N	N	Negative
84	Suspicious	Thick 2X	Thick 2X	Thick 2X	Positive
85	N	Thick 2X	Thick 2X	Thick 2X	Positive
87	Suspicious	P3	P3	P3	Positive
88	Suspicious	Suspicious	Suspicious	Suspicious	Suspicious
89	N	N	N	N	Negative
91	N	N	N	N	Negative
93	N	N	N	N	Negative
81	N	N	N	N	Negative

In our ophthalmic and intradermal tests the symbols used and code followed are those described by Ernest and Lash¹⁵ in their circular on "Tuberculin Testing of Livestock."

animals, nos. 84, 85 and 87, showed a positive reaction, while no. 88 could be called nothing more than suspicious. The results of the twenty-four-hour readings are tabulated in table 3.

Subcutaneous Test—As the calves had been running loose during the five months since injection with avian tubercle bacilli, they were tied up daily for a few days commencing May 7, to allow them opportunity to quiet down. Temperatures were taken at various hours during the day for several days but some of them continued to run high temperatures. It was not deemed advisable to inject them for the subcutaneous test until all the animals, including controls, had quieted down and the temperatures were down to normal. Various methods of feeding and watering were followed and it was finally found best to leave halters on the animals and let them run loose in the small lot. Leaving halters upon animals made it easy to catch them and they soon became quiet enough so that one could walk up to them. It was not until May 22, with continuous daily handling, that all pre-injection temperatures came down to normal. During the pre-injection-temperature period and the day on which the post-injection temperatures were taken, animals had access to water tank (but water was not very cold). They were fed in the evening on both days. Pre-injection temperatures and post-injection temperatures are shown in tables 4 and 5.

TABLE 4—PRE-INJECTION TEMPERATURES, MAY 22, 1923, FOR
SUBCUTANEOUS TEST

Ear Tag No.	11:30 a.m.	2:15 p.m.	4:30 p.m.	9:15 p.m.
83	101.1	102.5	102.7	101.8
92	101.4	101.8	102.3	101.8
84	101.9	102.3	102.5	102.1
85	102.1	102.4	102.4	101.9
87	101.7	102.6	102.6	102.2
88	101.6	101.8	102.5	102.1
89	101.4	102.5	102.7	102.5
91	101.2	102.1	102.4	102.0
93	102.1	102.4	102.5	102.6
81	102.1	102.3	102.8	102.3

5 cc B. A. I. tuberculin injected at 10 p. m.

TABLE 5—POST INJECTION TEMPERATURES, MAY 23, 1923

Ear Tag No.	A. M.			12 M.	P. M.				
	6	8	10		2	4	6	8	10
83	1.6	1.1	1.8	2.5	1.7	2.8	2.7	2.6	1.9
92	1.3	1.1	1.7	1.4	1.8	2.2	2.5	2.7	1.7
84	1.9	1.6	1.9	3.0	2.8	3.0	2.6	2.4	1.5
85	0.7	0.8	1.8	2.6	2.2	3.2	3.3	3.2	1.8
87	1.2	0.8	1.8	2.7	2.2	3.3	3.2	3.0	1.9
88	1.9	1.0	1.8	2.2	2.5	3.0	3.0	2.3	2.2
89	1.6	1.6	1.8	2.0	2.0	2.0	2.6	2.2	2.0
91	1.0	1.0	1.8	1.2	1.8	2.8	2.7	2.8	1.7
93	0.9	0.9	2.0	2.2	1.5	3.2	2.6	2.0	1.7
81	1.6	1.2	2.0	2.0	2.0	2.7	2.5	2.9	1.6

In the accompanying graph, pre-injection and post-injection temperatures can be easily compared. Much to our surprise the post-injection temperatures did not show the rise which we would expect. However, one will note from the graph that animals which showed positive reaction to the intradermal test (nos. 84, 85 and 87) showed a somewhat elevated temperature over their pre-injection temperatures. These temperatures remained elevated for some time, as is shown.

SUMMARY

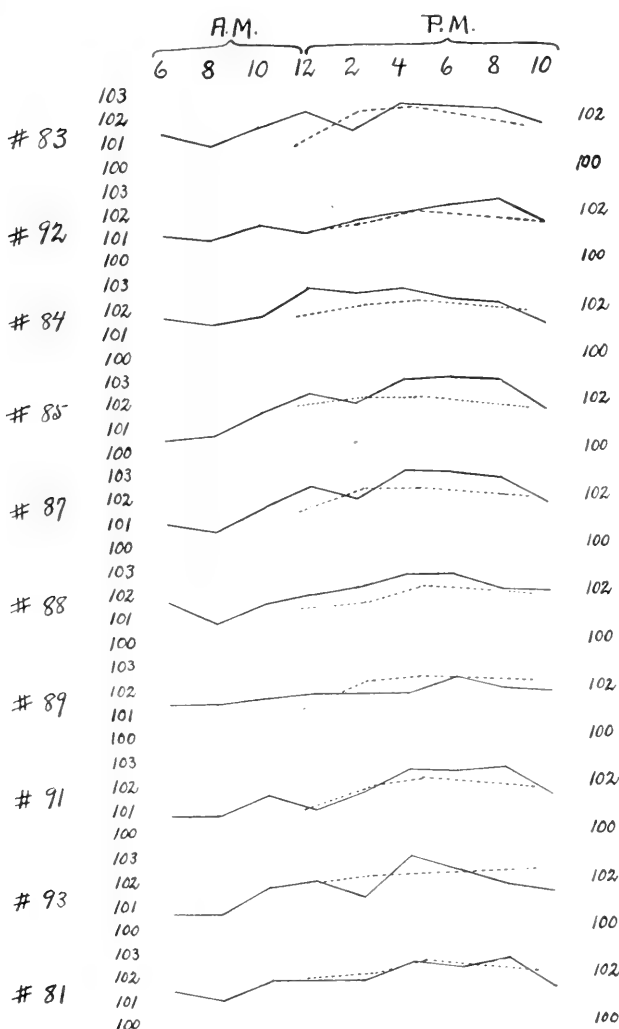
Our work would tend to prove that cattle can be infected with the avian tubercle bacilli when they are injected beneath the skin or into the muscular tissue with comparatively large numbers of organisms. When introduced between the layers of the dermis, no infection was produced.

Cultures of avian tubercle bacilli used were pathogenic for chickens as was shown by producing death in chickens which were injected with parts of the same suspension that was used in the cattle.

No reaction to the ophthalmic test was found in any calves showing lesions or otherwise.

Three very good intradermal reactions were found in two calves injected subcutaneously and one calf injected intramuscularly. One calf injected intramuscularly but with a smaller

amount than the last mentioned animal, gave only a suspicious reaction (not sufficient swelling to call a P. reaction).



Graph showing temperature curves.

Subcutaneous tests on calves which showed lesions and gave reactions to intradermal test did not give a rise of 2° F. or more above the maximum temperature observed prior to the injection of tuberculin, nor a temperature above 103.8° F. (This is what we usually consider a reactor.)

In injecting, 5-cc quantities of Bureau of Animal Industry subcutaneous tuberculin were used to insure that calves received a full 0.5 gram O. T. The lesions produced were identical with the lesions described in the so-called skin form of tuberculosis.

At the close of the experiment, the calves were all strong, healthy and in as good or better flesh than when started on the experiment.

CONCLUSIONS

Our work described above would indicate that the intradermal test is the most reliable test in detecting tuberculosis in cattle when they are infected with avian tubercle bacilli. The ophthalmic test gave no indications of infection. Boerner and Kimball¹⁶ report a bull, with lesions of tuberculosis in the subcutaneous tissue, which a few months previous to their observation had successfully passed an ophthalmic and subcutaneous tuberculin test. This immediately raises the question in our minds: Might this animal have been carrying the avian tubercle bacilli? This would seem very possible in the light of the above and in view of the fact that artificial infection with that organism gave typical lesions of the skin form of tuberculosis.

Another point is raised: Could these several cases in which only suspicious reactions are obtained on the intradermal test and which on retesting with the subcutaneous method give negative reactions have any relationship to the avian infection? We are all aware that this is not unusual, as many workers use the subcutaneous test to check questionable reactions to the the intradermal test.

FUTURE WORK

Further work should be done to study more carefully the natural infection of cattle with the avian form of the tubercle bacilli.

The three calves showing local lesions externally will be retained and the lesions found on palpation removed and studied. After a few months, the calves will be retested to see if they still react to the tuberculin test. If they do not, we would assume that they had only a circumscribed lesion. They will then be killed and careful and complete autopsies made.

ACKNOWLEDGEMENTS

We wish to thank Dr. B. F. Davis, former State Veterinarian, for his helpful suggestions and also Dr. G. W. Bond for his help

in tuberculin testing the animals before they were placed on the experiment.

REFERENCES

- ¹Day, L. E.: (1918) Jour. Amer. Vet. Med. Asso., liv (2), pp. 92-96.
- ²Christiansen, M.: (1915), Ztschr. Infekt. u. Hyg. Haust., 16, 4, pp. 264-274. Abst. in Exp. Sta. Rec., xxxiii, p. 283.
- ³Mohler, J. R., and Washburn, H. J., : (1908) U. S. Dept. Agri., Bur. Ani. Ind. Rpt., pp. 165-176.
- ⁴Bang, O.: Ztschr. Infekt. u. Hyg. Haust., 13 (1913), 5, pp. 215-225. Abst. in Exp. Sta. Rec., xxix, p. 479.
- ⁵Hastings, E. G. and Halpin, J. G.: Wis. Sta. Res. Bull. 28, pp. 249-271, pls. 7.
- ⁶Dunn, John J.: (1915) J. Eng. Board of Agri.
- ⁷Arloing, S.: Rev. Tuberc., 2 ser., 7 (1910). Abst. in Exp. Sta. Rec., xxvi, 178.
- ⁸Koch and Rabinowitsch: Arch. Path. Anat. u. Physiol. (Virchow) (1907) Beiheft, pp. 544, pls. 29. Abst. in Exp. Sta. Rec., xx, p. 282.
- ⁹Weber and Bollinger: Tuberkulose. Arb. K. Gesund. (1904), 1, pp. 83-158, pl. 1. Abst. in Exp. Sta. Rec., xv, p. 614.
- ¹⁰Giltner, Ward: (1912), (1913), (1914) Mich. Board of Agri.
- ¹¹DeJong, D. A.: (1910), Ann. Inst. Past. 24, 11, pp. 895-906.
- ¹²Schroeder, E. C.: (1921) Jour. Amer. Vet. Med. Asso., lxx (4), pp. 434-442.
- ¹³Schalk, A. E.: (1922) Jour. Amer. Vet. Med. Asso., lxi (4), pp. 397-410.
- ¹⁴Biester, H. E.: Ill. Ann. Rpt. (1921).
- ¹⁵Ernest, L. B. and Lash, Elmer: (1922) U. S. Dept. of Agri. Cir. No. 249.
- ¹⁶Boerner, Fred, Jr., and Kimball, V. G.: (1923) Jour. Amer. Vet. Med. Asso., lxii (6), pp. 751-754.

DISCUSSION

DR. R. C. REED: Mr. Chairman, I would like to ask Dr. Elder if in this work he at any time used an avian type of tuberculin or whether he always used an ordinary tuberculin in making these tuberculin tests; that is, after infection with the avian tubercle bacillus.

DR. SCHOFIELD: I would like to know whether the cattle, in the first case referred to, where the gentleman said certain herds had been tested and skin lesions were found and on these ranches chickens with tuberculosis also have been running, received the injection intradermally or subcutaneously? I, personally, fail to see how you can prove that the skin lesions that the inspectors are finding in our plants are due to the bovine type unless you make cultures from those lesions. You might be able to produce, with avian tubercle bacilli, a similar thing. That wouldn't settle the question as to whether the skin form was due to an avian infection, unless cultures were made from those skin lesions.

DR. ELDER: In answer to Dr. Reed's question, we always used the ordinary bovine tuberculin. We did that for the reason that we felt we should use, in our experiment, what was being used in the field.

In answer to the other question, the intradermal tests were the ones which pointed out the reactors in the field. At that time we did not have the experiments outlined and we did not make cultures from those lesions. However, I understood from the state officials that those lesions, when examined, showed acid-fast organisms. They did not say whether they were typical of the avian type or of the bovine type. Our experiment was outlined after those were found and we thought possibly there might be a relationship between the skin form and the avian type. We did not mean to leave the impression that all of the skin form of tuberculosis is caused by the avian organism.

The Faculty of the University of Pennsylvania School of Veterinary Medicine gave nine lectures, during the month of December, in connection with the Veterinary Extension work in the State of Pennsylvania.

A drive was recently conducted in Crawford County by the Pennsylvania Bureau of Animal Industry, in an effort to make that county a tuberculosis-free area.

PORCINE ERYSIPELAS¹

By J. W. PARKER, ASHE LOCKHART and J. D. RAY

Kansas City, Missouri

That diamond skin disease is a mild or chronic form of swine erysipelas has been generally accepted for a number of years. The acute, fatal form of the disease has not been supposed to exist in the United States. Recently evidence has been accumulating indicating that erysipelas does occur in acute form and is the cause of some economic loss. Creech¹ found *Erysipelothrix porci* (*B. erysipelatis suis*) in the skin of hogs affected with diamond skin disease. Ward² isolated *E. porci* from sixteen out of twenty-two sets of legs of hogs affected with polyarthritis, advanced lesions being usually sterile. Giltner³ found *E. porci* the apparent cause of an essential bacteremia, presumably the cause of the death of several pigs.

Having observed, in the course of post-mortem work at packing houses, the occasional association of diamond skin disease (urticaria) and extensive necrotic dermatitis with lesions of polyarthritis in early stages, and with septicemia and icterus, one of the authors of this paper began to suspect an etiologic relation of these several groups of lesions. In the spring of 1922 systematic observations were begun at one of the large packing-houses, in cooperation with Dr. J. B. Thompson, Veterinary Inspector, U. S. Bureau of Animal Industry. The immediate purpose was to determine what lesions were commonly associated with urticaria and necrotic dermatitis (rather commonly referred to as "frozen back").

In a period of three months (March 15 to June 15) one hundred ten cases were tabulated. In this tabulation "skin lesions" refers to distinctly rhomboidal urticaria (diamond skin disease), or necrotic dermatitis. These were frequently associated in the same subject. We had not yet learned to recognize a diffuse or irregular erythema that seems to characterize an acute form of the disease frequently associated with septicemic lesions. "Joint lesions" refers to an early stage of polyarthritis; in some cases only slight reddening of the synovia and of the villi of the synovial capsules, with slightly red or yellow periarticular infiltration. Other cases presented flocculi in the synovia and

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

periarticular fibrinous organization, causing slightly deforming arthritis, usually best observed in the stifle, hock, tarsal and carpal joints. "Gland lesions" refers to an enlarged, edematous condition of body lymph-glands, not immediately related to arthritic joints, with or without injection and hemorrhages. Arthritis evidently due to traumatism or other causes, and enlarged and edematous glands with related lesions accounting for them, were not recorded.

TABLE OF RELATED LESIONS

Skin lesions only	20 cases
Joint lesions only	20 cases
Skin and joint lesions	19 cases
Skin and gland lesions	16 cases
Joint and gland lesions	13 cases
Skin, joint and gland lesions	22 cases

Some of these cases presented, in addition, a soft dark or black spleen, not much enlarged, a few petechiae in kidneys, hemorrhagic body lymph-glands, petechiated lungs and p'aura, more rarely a slight pneumonia. In a few cases slight enteritis was observed. Icterus, from slight discoloration to the most intense, was observed in severe cases. Some eight or ten of those tabulated were condemned for septicemia or icterus.

It will be noted that of the one hundred ten cases tabulated, 20% showed lesions of the skin, joints and glands; 14½% had both skin and gland lesions; 17% had skin and joint lesions; and 12% had joint and gland lesions. A total of 63½% had two or three groups of lesions. It is reasonable to assume that lesions may be limited to the skin in mild cases, and also that polyarthritis may persist after the disappearance of skin lesions.

Having established, as we believed, a probability that these several groups of lesions are from a common cause, we began May 16 to select cases for laboratory study. Cultures were made from twenty-four cases. Some were selected to "feel out" the character of lesions that might be expected to yield *Erysipelothrix porci*. Among these were three cases of advanced polyarthritis, a diffuse erythema without other lesions, an icterus case with large black spleen, two cases that were probably cholera and a skin-necrosis case without other lesions. Cultures did not develop *E. porci*, or other known pathogenic organisms.

Individual descriptions of the sixteen other cases, with laboratory results, follow:

No. 1. Diamond skin lesions with acute, diffuse dermatitis, the inflammation extending into the subcutaneous fat in spots. Slight, acute polyarthritis, with fibrinous deposits in some joints. Body glands edematous. Spleen enlarged. Petechial hemorrhages on pleura. Cultures of *Erysipelothrix porci* were obtained from skin and joints.

No. 2. About sixty, typical, diamond skin disease lesions. Glands edematous, spleen soft. No pathogenic organisms isolated.

No. 4. Typical diamond skin disease lesions, with slight skin necrosis. Glands edematous, kidneys petechiated. No pathogenic organisms isolated.

No. 5. Extensive, acute diamond skin disease, with a few necrotic centers. Yellowish infiltration into subcutaneous fat one inch. Joints normal. Glands edematous. Spleen black, soft, not enlarged. Slight lobar pneumonia and a few subpleural petechiae. Cultures of *E. porci* were obtained from glands and skin.

No. 6. Diamond skin disease, numerous spots but small. Slight arthritis of sacro-femoral joint. Glands edematous. Spleen black, soft. Icterus pronounced. Hog condemned. *E. porci* was obtained from glands, kidney and spleen.

No. 12. Extensive diffuse and irregular urticaria, with some typical diamonds seem fading. Superficial necrosis on hocks and rump. Yellowish discoloration into subcutaneous fat. Glands hemorrhagic and edematous. No deformity of joints, but synovia thick, viscous, and stained rather highly yellow. Articular villi reddened. Spleen black, soft, not enlarged. A few petechiae in kidneys and subpleural. A slight local enteritis (part of jejunum) and congestion of related mesenteric glands. Cervical glands tuberculous. General, dirty-yellow discoloration. Hog condemned. Cultures of *E. porci* were obtained from heart-blood, kidney and joint.

No. 13. Urticaria (two rhomboidal areas, about two-inch sides) on top and side of shoulder. Seem fading. Possibly ship marks. Other erythematous areas, both discrete and diffuse, but irregular, on back and side. Carpal and tarsal joints considerably enlarged, with typical articular and periarticular conditions. Stifle not much enlarged, but has excess of straw-colored synovia and hypertrophy of synovial villi. All feet up to hocks and carpal appear bruised, with breach of continuity and necrosis. Related glands (iliac and prepectoral) much congested and edematous. Slight pneumonia. Kidneys slightly petechiated. Cultures from carpal joint and kidney. No pathogenic organisms isolated.

No. 15. Very acute dermatitis, several large spots extending into subcutaneous fat. A few doubtful diamonds. Necrotic areas on snout, under eye and on ear. A few petechiae on legs. Glands intensely congested, edematous and hemorrhagic. Spleen, black spots like in cholera. No arthritis. A few petechiae in kidneys. Hog condemned. No pathogenic organisms isolated.

No. 16. Skin presents numerous irregular red spots covering about one-third of back, sides and hams, superficially necrotic, redness extending sometimes into fat. Glands hemorrhagic. A little pneumonia. Spleen injected. One petechia in kidney. Part of ear necrotic. Skin, precutaneous gland, spleen and kidney yielded *E. porci*.

No. X. A precutaneous gland from a hog apparently of the same lot as No. 16, was taken for culture and *E. porci* isolated. The same description fits this hog. Some twenty or thirty cases of erythema, urticaria and skin necrosis were seen during the day, apparently same class of hogs, probably of one shipment, but as few of the skin lesions were typical, either of diamond skin disease or extensive necrosis, cultures were made from only these two, both of which were condemned for septicemia.

No. 17. Early stage of skin necrosis on back and over shoulder to ears, edges acute, raised. Glands slightly edematous and pigmented, with injected borders. One petechia in kidney. Spleen has one dark spot, size of a quarter. Liver firm. Lungs, diffuse redness, a few congested areas, possibly a little hepatization. Joints, slight, straw-colored, intra-articular and peri-articular infiltration. Cultural results negative (contamination).

No. 19. Was "suspected" as a "crip." No temperature taken. Skin showed acute urticaria over all parts of the body, legs and head, mostly irregu-

lar shapes, spots intensely red, skin thickened and superficially necrotic in patches. Inflammation extends into fat some distance. A few typical diamonds. Body glands enlarged, hemorrhagic, but not juicy. Synovial fluids and membranes slightly straw-colored. Spleen slightly enlarged, soft and black. A few petechiae in kidneys. Condemned for septicemia. Cultures from skin, glands, joint, spleen, liver and kidney. *E. porci* obtained from skin only.

No. 20. General erythema almost covering the body, some patches superficially necrotic, and small hemorrhages in skin; inflammation extends deep under necrotic areas, with yellowish tinge and dead look. All glands edematous and hemorrhagic peripherally. Kidneys had a few petechiae in the pyramids. Synovia slightly yellow. No pathogenic organisms isolated.

No. 21. Extensive urticaria, mostly confluent and irregular, but some typical diamonds. Slight superficial skin necrosis. Glands enlarged, edematous and hemorrhagic. A few petechiae in kidneys. Joints slightly straw-colored, peri-articular infiltration. Viscera passed on routine inspection, so had no special examination. Condemned for septicemia. Cultures from skin, glands and kidney all yielded *E. porci*.

No. 22. Skin showed extensive irregular urticaria, all parts of body, head and legs. (About half of surface reddened). Some areas superficially necrotic, inflammation extending one-half inch into fat. Some areas merely erythematous, others present distinct thickening of skin with raised margins. A few typical diamonds. No petcheial hemorrhages as in cholera. Joints, straw-colored synovia (very slight color), and distinct straw-colored infiltration. Slight flocculation of synovia. All glands much enlarged, edematous, and congested to hemorrhagic. Many petechiae in kidneys, mostly cuticular, smaller than usually seen in cholera. A few hemorrhagic areas in lungs, one to several lobules in area, many petechiae in lung substance, a few slight pneumonic areas. A few petechiae on valves of heart and in auricles, but no vegetative growths. Spleen enlarged (x8) a little dark and softened. Liver firmer than usual, bile very thick, granular and black. General color of carcass slightly icteric (a greenish-yellow tinge). Viscera practically empty. Two so-called cholera ulcers near iliocecal valve. Condemned for septicemia. Cultured from heart, spleen, kidney, skin and joint. *E. porci* isolated from skin culture.

No. 23. Diamond skin lesions intense, well scattered, superficially necrotic. Also erythema over large part of body. Joints show excess of stained synovia. Glands edematous and hemorrhagic. A few petechiae in kidneys and in heart. Lungs congested, with a little lobular pneumonia and petechiated. Spleen slightly enlarged and soft. Enteritis, two-thirds of small intestines. Slightly icteric. Cultures from heart, skin, gland, kidney and spleen. *E. porci* was obtained from two glands.

Most of the subjects, those tabulated, laboratory cases, and others observed but not recorded, were light hogs, dressing one hundred twenty to one hundred fifty pounds. Some were pigs, twenty to thirty pounds. A few were over two hundred pounds. The greatest number of cases were observed between March 1 and June 16, after which they were rather rare during 1922. The same seems to hold true for 1923, to this date.

Nos. 16 and X did not present typical diamond skin disease lesions. The urticarial areas were thickened, but irregular in shape. Laboratory results on cases Nos. 13, 15, 17 and 20 may have been influenced by use of culture media that had dried till the surface was "leathery." It had been thought advisable to keep culture tubes at the packing-house and perform inocula-

tions there, the result being dried media. The presence of cholera could not be definitely excluded in any of the cases.

In identifying *Erysipelothrix porci* the methods of standard bacteriological texts and of G. T. Creech were followed. The first nine cultures which we have considered to be *E. porci* were sent to the laboratories of the Bureau of Animal Industry, Washington, D. C., from which the following reply was received:

"Referring to your letter of February 8, relative to nine cultures of an organism forwarded to this laboratory for identification, you are advised that in their various characteristics, and also for their pathogenicity for pigeons, all of the strains were found to be typical of the *Erysipelothrix porci*."

The cultures sent the Bureau of Animal Industry included one culture obtained from a spleen specimen sent to the laboratory by a practicing veterinarian. The only history available was that a number of hogs in a herd had died of an acute condition.

RECAPITULATION:

Tabulation of one hundred ten cases of diamond skin disease and polyarthritis (effort being made to exclude arthritis of traumatic origin and skin and gland lesions evidently due to causes other than erysipelas) indicates that certain, typical, skin, joint and gland lesions were associated in 20% of the cases, and that two of these groups of lesions were found in 43%, a total of 63% with "associated" lesions. Out of sixteen cases believed to present the lesions of erysipelas in mild to acute form, *Erysipelothrix porci* was isolated from body lymph-glands, heart-blood, spleen, kidneys, joints or skin in ten cases. No other cause for septicemia (bacteremia) was evident on post mortem, and no other suspicious organisms were found as a result of the cultures. No record of condemnations for septicemia or icterus apparently

TABLE I.—TISSUES FROM WHICH *E. PORCI* DEVELOPED

Tissue	1	5	6	12	16	X	19	21	22	23
Skin	x	x			x		x	x	x	
Gland		x	x		x	x *		x		x
Joint	x			x						
Heart				x						
Spleen	‡		x		x					
Kidney			x	x	x			x		

*No cultures made from other tissues.

due to erysipelas was kept, as we had not reached a point of sufficient accuracy in diagnosis, and this report was not then contemplated. It is certain, however, that some fifteen or more cases presented lesions believed to justify the diagnosis of icterus or septicemia from porcine erysipelas, and in ten of these cases *E. porci* was found.

REFERENCES

- ¹Creech, G. T.: The bacillus of swine erysipelas isolated from urticarial lesions of swine in the United States. Jour. A. V. M. A., lxi (1921), n.s. 12 (2), pp. 139-150.
²Ward, A. R.: The etiology of polyarthritis in swine. Jour. A. V. M. A., lxi (1922), n.s. 14 (2), pp. 155-161.
³Giltner, L. T.: A fatal disease of young pigs apparently caused by the bacillus of swine erysipelas. Jour. A. V. M. A., lxi (1922), n. s. 14 (5), pp. 540-543.

PRIZES FOR PRACTITIONERS

At the first annual meeting of the Dixie Veterinary Medical Association, held in Memphis, Tenn., a short time ago, an innovation consisted of the awarding of a number of prizes to practitioners in attendance at the meeting. For the purpose of awarding these prizes, a committee was appointed by the President. The awards follow:

Three thousand cc of Memphis brand anti-hog cholera serum, donated by the Memphis Serum Company, to the oldest practitioner in attendance, awarded to Dr. D. A. Piatt, of Birmingham, Ala.

One dozen tetanus antitoxin, 1500-unit, syringe containers, donated by the Wilmer Veterinary Supply Company, of Memphis, to the practitioner traveling the longest distance to the meeting, awarded to Dr. W. G. Ross, of Arabi, La.

One thousand cc of Corn States clear anti-hog cholera serum, donated by the Corn States Serum Company, of Omaha, Nebraska, to the tallest practitioner attending the meeting, awarded to Dr. W. G. Warren, of Gallatin, Tenn.

One dozen pyoktanin blue, donated by the Swan-Myers Company, of Indianapolis, Ind., to the practitioner with the reddest hair in attendance at the meeting, awarded to Dr. M. J. Luster, of Clarksdale, Miss.

One thousand cc of Sihler clear anti-hog cholera serum, donated by the Sihler Serum Company, of Kansas City, Mo., for the shortest practitioner in attendance, awarded to Dr. L. J. Hinson, of Newbern, Tenn.

IMMUNIZING YOUNG PIGS AGAINST HOG CHOLERA¹

By J. W. BENNER

*New York State Veterinary College, at Cornell University,
Ithaca, N. Y.*

The eradication of hog cholera depends largely upon the successful vaccination of young pigs. I mean by successful vaccination, a vaccination with the minimum stunting effect that will confer upon the pig an immunity that will protect against any infection to which the animal may be exposed and an immunity of long enough duration to fill the practical requirements of the swine grower.

This subject has been worked upon and discussed by Cahill, Birch, Niles and Rietz, Pickens, Welsh and Poelma, Dimock, Kinsley, Steel and others, but there still remain important points which are undetermined. The results of experiments have not always coincided, clinical evidence has differed and theories coupled with facts have as usual contributed their share to the confusion.

In our present method of vaccinating hogs against cholera, the serum and labor are the chief terms of expense to the owner. The rapidity and ease of handling and the quantity of serum used depend directly upon the size of the animal vaccinated. Therefore, we can say that with pigs growing normally, the younger the pig the cheaper the vaccination. Decreasing the expense without decreasing the efficiency is sure to increase the number of swine immunized against cholera and thus advance eradication.

In 1911, while in general practice in eastern Kansas, where corn and hogs are very important factors in the farming system, I used at first the method which at that time was called the "double treatment" on all sizes of hogs. This so called "double treatment" consisted of administering serum alone, the dosage being regulated by the live weight of the animal, and in a week or ten days followed it with an administration of serum and virus, the doses of each again being regulated by live weight. It is in this sense that I will use the term "double treatment" and not in the sense of a synonym for the simultaneous method as it has frequently been used.

¹Read at the thirty-third annual meeting of the New York State Veterinary Medical Society, Ithaca, N. Y., July 25-27, 1923.

The results were good when animals were given the "double treatment." It was a very safe, efficient way of producing a solid, lasting immunity but too expensive, due to the large quantity of serum used in the two administrations, especially in the older animals. The necessity of handling the older animals twice was in itself expensive in time and energy consumed. More confidence in the simultaneous treatment as used today, without the preliminary treatment of serum alone, caused the old "double treatment" to be dropped when vaccinating a healthy herd of adult swine but it is still used to good advantage in a modified way in a herd sick with hog cholera and in young pigs.

In the two latter classes of swine the "double treatment" (I am using the term as just described) has been modified by extending the interval between the administration of serum alone and the simultaneous administration of serum and virus.

In an infected herd consisting of some sick animals and some that are still well but that have been exposed, with the owner's consent I administer serum alone to all animals in the herd except those in a moribund state and in about three weeks administer serum and virus to those that are normal.

Another rather common way of handling an infected herd is to take temperatures and give the simultaneous treatment to hogs with normal temperatures and even to some with temperatures slightly above normal, and treat with serum alone or not at all those showing high temperatures. The fault I find with the latter method is that by using the virus in a sick herd one can easily be blamed, and perhaps justly, by the owner for losses which are sure to follow treatment. I know of no conclusive proof that the simultaneous treatment on animals in the incubation period of hog cholera, especially near the end of the incubation period, is as safe to use as serum alone.

The modification of the "double treatment" as used on young pigs consists in administering one or two, or even three, serum-alone treatments at intervals of three or four weeks, followed by the simultaneous treatment when the pigs are from nine to twelve weeks of age. Cahill¹ reported in 1918, after finding that the "simultaneous treatment" on "baby pigs" did not confer a permanent immunity, that he adopted this modified method with very satisfactory results. Quoting from Cahill's paper on this subject, he says in referring to the "simultaneous treatment" on "baby pigs":

"As a state control method it was considered dangerous and was discarded. Since that time young pigs are treated as follows: At weaning time (usually six weeks in the East) pigs are given serum-only treatment; six weeks later they are given the simultaneous treatment, using 2 cc of virus. Since adopting this method outbreaks of hog cholera in herds so treated are practically unknown, regardless of the length of time the animals are kept or the amount of infection to which they are exposed."

A little later the question was raised by some as to whether a serum-alone treatment preceding the simultaneous administration of serum and virus would interfere with the latter in conferring a permanent immunity.

Clinical evidence had proved this point when the original double treatment was in use. Large numbers of hogs were vaccinated and permanently immunized by this method in 1910 and 1911. In 1919 Birch confirmed this with experiments and reported conclusively that a serum-alone injection preceding the simultaneous treatment would not interfere with the efficiency of the latter in producing a permanent immunity in swine so treated.

Birch, in the same report, uses the term "the follow-up treatment" for the modified double treatment which he recommended for general use and which has given excellent results.

The "follow-up treatment," as we use it, is in principle the same as Cahill described in the quotation I gave from his paper, except that instead of giving the first serum-alone treatment when the pigs are six weeks of age we frequently give the first serum-alone treatment at three weeks or younger and then instead of waiting six weeks and giving the simultaneous treatment, we frequently give another serum-alone treatment in three or four weeks and after three or four weeks more, when the pigs are nine or ten weeks of age, give the simultaneous treatment.

Birch prefers pigs to be twelve weeks of age before using the simultaneous method.^{2,3} If the first treatment is given at three weeks of age, the second at six weeks, the third at nine weeks, the simultaneous at twelve, it would necessitate four handlings of the animals and the dose of serum would be graded about as follows: First treatment, 10 cc; second treatment, 15 cc; third treatment, 20 cc; fourth treatment, 20 cc plus 1 cc of virus. As a matter of fact, the intervals between treatments are usually lengthened and the simultaneous treatment administered when the pigs are nine or ten weeks of age instead of twelve weeks, thus eliminating one and sometimes two of the treatments.

We have had and are having excellent results from the use of

the follow-up treatment on young pigs. It is playing the game safe, so to speak, the same as the original double treatment was, but it has also the same faults the original double treatment had, that is, it is too expensive on account of serum used, veterinary fees, time and energy consumed in handling the pigs and added to this, there is the natural dislike which a good swine husbandman has for corralling his pigs, holding them up by hind or front legs and having hypodermics administered.

Since our confidence was shaken by Cahill's results it is of utmost importance that experimental data be compiled and published on a sufficient number of animals to inform us of the earliest possible age at which simultaneous treatment can be successfully given.

Niles and Rietz, and Pickens, Welsh, and Poelma have already contributed work on this subject and it is the main purpose of this paper to present additional evidence, not necessarily conclusive.

We consider three weeks a very good age for vaccinating. At this time pigs that were weak at birth have either died or grown stronger. They are easy to handle and since 10 cc or less of serum and 1 cc or less of virus is sufficient for pigs of this age, it means that the expense is comparatively low.

Few pigs under three weeks of age die of cholera. There have been some discussions regarding the nature of immunity against the disease which young pigs possess, especially in those farrowed by immune sows. Pickens has found, and it will also be seen in the following experiment, that a large percentage of pigs suckling immune mothers have enough immunity at three weeks of age to protect them against an injection of potent hog cholera virus without any injection of serum whatsoever. The influence which the presence or absence of the immunity present in young pigs has upon the immunity conferred by the simultaneous treatment has also been questioned and discussed.

In 1919 Birch⁴ wrote on these points as follows:

"What is the essential difference between young pigs that receive permanent immunity as a result of simultaneous treatment, and those that do not? Without reasonable doubt the difficulty is to be referred to the absence of persisting natal immunity on one hand and to its presence on the other. At least we have before us the facts that natal immunity will persist in many pigs and disappear in others, and coinciding with these facts we have the knowledge that simultaneous treatment confers permanent immunity in some pigs, and fails to confer it in others. And we know, in general terms, that active immunity can be produced only in

⁴The Cornell Veterinarian. Vol. IX, No. 2. April, 1919.

animals that at the time of immunization are susceptible to the particular disease against which we seek to immunize. We know also that pigs given simultaneous treatment after they have attained an age when all can be regarded as susceptible are rendered permanently immune by the treatment. The fact that some "baby pigs" become permanently immune as a result of simultaneous treatment, seems to indicate that the presence or absence of natal immunity in young pigs is a matter governed by age and predetermined, individual characteristics, rather than a matter of milk diet as is so frequently asserted.

"Incidentally it is interesting to observe that although natal immunity and serum-alone immunity in young pigs are regarded as being of the passive type, there appears to be a distinct difference between the two: if virus and serum are given while natal immunity still persists, active immunity is not conferred; but virus and serum administered during the existence of passive immunity due to serum alone, usually, if not always, produce active immunity."

From the reports of hog cholera serum producers and some practitioners who have found adult swine susceptible after having been given the simultaneous treatment as "baby pigs," it has seemed at times that the immunity in the very young animals of this species differs from any artificial immunity conferred by the serum-alone treatment. Peculiarities of the very young in other species have been noticed, for example: toxicologists have reported that young puppies tolerate strychnin better than do older dogs, young children tolerate calomel better than do adults. Another example that may be still more closely analogous is the immunity of infants to parotitis or mumps.

On the other hand a peculiar susceptibility may exist in the very young which is not present in adults, as is seen in the susceptibility of children to scarlet fever and diphtheria. A peculiarity of this nature may exist in very young pigs. It may be in the nature of a natal immunity such as Birch explained in the quotation given. The presence or absence of this natal immunity in the very young may influence the efficiency of the simultaneous treatment when it is administered to this class of swine as also explained by Birch. But, judging from the observations made in the experiment which follows, I would say that if a natal immunity different from any artificial immunity does exist in pigs, that it exists for a very short time only and that at three weeks of age the pig has a passive immunity produced by antibodies which it is obtaining in the mother's milk.

This passive immunity is like the passive immunity conferred upon the pig by the injection of anti-hog cholera serum. It may vary in grade. If the pig is getting a good flow of milk from an immune mother, even though it may be exposed to infection it is safe from the disease. If for any reason the milk-flow is diminished, or if some of the smaller animals in the litter

are fought back by more thrifty ones, danger from the disease increases due to the decrease of antibodies taken into the system. In other words, a certain quantity of milk containing antibodies is necessary to protect the pig against cholera in this case, the same as it is necessary to introduce a certain quantity of antibodies when injecting anti-hog cholera serum simultaneously with hog cholera virus, as is done in the simultaneous method to protect the pig against the disease. It has long been known that when pigs are weaned they become susceptible.

The following experiment gives some light on these points as well as on the main question which has already been given as the purpose of the work, namely, to learn if simultaneous treatment will produce a solid, lasting immunity in pigs three weeks of age.

In order that conditions might be carefully controlled and close observations made, it was decided to breed sows and raise pigs for this experiment. The boar and sows were immune to cholera. All animals used in the experiment were grain-fed.

From ten sows we had sixty-four pigs reach the age of three weeks. No pigs died after they were two or three days old until after vaccination. During this time, prior to vaccination, they were kept in a hog-house where there was considerable chance for exposure to hog cholera but all remained well. At three weeks of age all pigs in each litter except one were given ten cc of stock anti-hog cholera serum and one cc of virus. The injection of serum was made into one axilla and the virus into the other. The one remaining pig in each of the ten litters was given one cc of the virus and no serum. Three weeks after treatment, when the excretions of the pigs were considered to be free from virus, the pigs were dipped in a 2% lysol solution and moved to cholera-free grounds. They were grain-fed for five months, then moved to pens that were kept clean but where no effort was made to keep cholera contamination away. At the time of this change each pig was given two cc of a potent hog cholera virus by intra-axillary injection.

Of the sixty-four pigs vaccinated at three weeks of age, fifty-eight lived to receive the trial injection of virus five months and three weeks later. Six had died between the time of simultaneous treatment and the time of the trial injections. Two of the six were the only pigs in the litter (No. 10) as is shown in the accompanying table, and were peculiar pigs from time of birth. They were abnormally small when born and at three weeks of age one

had developed to be exceptionally fat and chubby, the other very small and lean. When the simultaneous treatment was administered to this litter of two, the lean one was treated with virus alone. The fat one was given the serum and the virus. The latter died in ten days after injection and showed hog cholera lesions. The pig that received the virus alone died in twelve days and showed practically the same lesions as its litter mate that had died in ten. I am unable to explain the abnormally small size of these two pigs at birth, their freakish development to three weeks of age, their death ten and twelve days after treatment or the lesions found on autopsy.

Another of the six pigs that died during the period stated was one in litter No. 13 which had received the simultaneous treatment. It became sick eight days after having been vaccinated, at three weeks of age, and died two days later or ten days after the injections. Lesions found were suspicious of hog cholera. We injected a cholera-susceptible pig with one cc of the heart-blood and a rabbit with one-fourth cc of the heart-blood. Both the pig and rabbit remained well. The pig used to aid in this diagnosis was injected later with a hog cholera virus of known potency and became sick with the disease, proving its susceptibility, and the absence of hog cholera in the pig of litter No. 13 that died. The fourth of the group that died had a bad scrotal hernia and died following castration. The fifth became runty and died; autopsy revealed a very bad infestation of ascarids. The sixth and last became runty; autopsy revealed a chronic peritonitis, cause undetermined.

After the trial injection of the fifty-eight head temperatures were taken on each animal for seven days as shown by the accompanying charts.

TEMPERATURE CHART FOR LITTER 6

Pig No.	Day of Injection	Post-Injection Temperatures						
		1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.
1	102.1	105.9	101.4	102.6	102.8	102.0	105.4	102.2
2	102.2	104.0	102.2	102.0	103.8	103.2	104.0	103.2
3	102.2	102.0	103.7	102.8	104.8	102.0	103.2	104.0
4	100.6	102.2	102.9	102.6	102.0	101.4	102.2	101.0
5	102.3	103.1	103.4	103.8	103.6	101.3	102.2	102.1

TEMPERATURE CHART FOR LITTER 8

Pig No.	Day of Injection	Post-Injection Temperatures						
		1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.
1	100.9	103.4	102.9	103.0	102.6	101.0	102.7	102.6
2	100.0	102.2	103.4	102.4	103.8	101.4	102.3	102.7
3	102.2	102.9	101.6	102.6	103.6	101.4	101.3	102.2
4	101.2	102.4	101.2	101.0	102.4	102.3	102.2	101.8
5	100.6	102.4	100.9	103.8	101.8	102.8	102.6	101.6
6	101.0	102.5	101.7	102.1	102.6	102.3	101.9	101.8
7	100.0	102.1	101.6	102.8	102.7	103.0	102.0	101.5
8	100.4	101.9	103.1	102.8	102.8	102.6	101.0	101.5
9	102.4	100.4	105.1	101.8	103.6	101.3	101.6	101.2

TEMPERATURE CHART FOR LITTER 12

Pig No.	Day of Injection	Post-Injection Temperatures						
		1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.
1	104.4	103.3	103.2	104.3	104.0	102.6	104.0	103.6
2	104.0	103.2	103.6	102.9	101.4	103.0	102.0	103.0
3	103.3	103.9	104.0	104.6	104.4	104.8	103.8	104.0
4	102.0	101.4	102.8	103.3	103.0	103.6	103.5	104.8
5	104.0	102.8	103.4	103.7	103.0	102.4	103.3	102.8
6	102.4	103.1	103.4	103.8	103.6	102.3	103.4	103.8
7	102.4	103.3	102.2	104.2	102.6	103.0	103.3	103.8
8	103.4	103.0	101.8	102.4	104.2	102.9	103.0	103.3
9	102.6	102.8	102.8	103.8	104.0	103.2	103.7	103.6

TEMPERATURE CHART FOR LITTER 11

Pig No.	Day of Injection	POST-INJECTION TEMPERATURES						
		1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.
1	102.0	104.0	103.8	104.3	103.1	103.8	102.0	103.6
2								
3	101.2	103.6	103.0	103.8	102.8	103.8	103.8	102.8
4								

TEMPERATURE CHART FOR LITTER 1

Pig No.	Day of Injection	Post-Injection Temperatures						
		1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.
1	102.1	102.9	103.8	103.2	103.1	101.5	103.2	102.0
2	101.4	103.8	102.0	104.2	104.5	104.1	103.8	103.8
3	102.0	103.4	104.8	103.8	103.0	102.8	103.2	103.6
4	102.6	103.9	104.4	104.4	101.6	101.3	102.1	104.6
5	101.8	103.6	103.4	103.1	102.8	101.3	104.1	103.6

TEMPERATURE CHART FOR LITTER 13

Pig No.	Day of Injection	Post-Injection Temperatures						
		1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.
1	102.4	100.8	103.4	102.2	102.1	101.8	102.7	101.9
2	102.2	103.0	103.2	103.6	102.3	102.7	103.4	102.3
3	102.6	102.8	100.7	103.2	102.2	102.6	100.7	102.3
4	103.4	103.2	102.0	102.6	102.1	101.4	101.6	102.9
5	102.0	102.4	103.4	102.3	102.6	102.4	101.8	102.1
6	102.8	103.0	103.0	104.4	103.7	102.6	102.8	102.3
7	102.6	102.6	101.8	103.8	102.1	103.4	104.5	103.1
8	101.8	102.9	101.6	101.6	102.6	104.2	103.4	103.0
9	102.4	102.2	103.0	104.0	102.4	102.4	103.4	102.0

TEMPERATURE CHART FOR LITTER 4

Pig No.	Day of Injection	Post-Injection Temperatures						
		1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.
1	102.7	102.0	102.4	102.2	101.1	103.2	100.6	102.0
2	102.6	102.2	102.7	101.2	100.4	102.1	101.7	101.0
3	103.0	103.0	102.1	101.6	102.8	102.2	102.6	101.8
4	102.7	102.6	102.6	102.2	102.0	103.4	102.0	103.1
5	102.4	103.2	102.6	101.4	102.7	102.6	101.2	100.8

TEMPERATURE CHART FOR LITTER 5

Pig No.	Day of Injection	Post-Injection Temperatures						
		1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.
2	101.8	102.2	102.0	102.6	102.0	102.0	101.4	
3	103.2	101.7	102.8	103.4	103.0	102.9	102.5	
4	103.0	102.4	103.4	103.2	103.0	102.5	102.4	
5	103.6	103.6	103.4	103.2	102.2	102.6	103.4	
6	102.4	103.2	102.0	104.0	102.7	102.4	102.8	
7	102.8	103.7	103.6	103.0	103.4	103.7	101.8	

TEMPERATURE CHART FOR LITTER 9

Pig No.	Day of Injection	Post-Injection Temperatures						
		1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.
1	103.5	102.6	102.6	102.3	103.3	103.6	101.6	103.4
2	102.2	102.3	103.3	103.0	103.4	102.4	101.6	103.3
3	102.8	102.4	102.0	101.6	101.9	102.9	102.6	103.0
4	103.1	103.4	99.8	101.9	100.4	102.0	102.7	101.8
5	102.8	103.0	101.7	102.0	101.2	102.6	102.5	102.4
6	103.0	102.4	101.6	101.5	102.0	101.4	101.1	102.1
7	102.0	104.2	101.8	102.2	103.4	101.3	101.4	103.9
8	103.3	102.0	101.8	101.2	103.1	102.4	101.4	102.2

In no case did we get a characteristic rise in temperature, inappetance, or sickness in any form. The pigs that had received virus and no serum at three weeks of age were in no way different from the ones which had received the simultaneous treatment.

The plan of the experiment is given in brief in table I.

In each case after a litter had been vaccinated, a cholera-susceptible pig was injected to check the potency of the virus. This was also done after each litter had been given the trial injection. In each case the virus was found to be very potent.

TABLE I

Body mark for identification of litters	Number of pigs given simultaneous treatment at 3 weeks of age (10 cc serum 1 cc virus)	Number of pigs given 1 cc of virus at 3 weeks of age	Number of pigs given trial injection of 2 cc of virus-alone, 3 months, 3 weeks after treatment	Results of the trial injection
8	8	1	9	Remained well
6	4	1	5	" "
1	4	1	5	" "
12	8	1	9	" "
10	1	1	0	" "
11	3	1	2	" "
13	9	1	9	" "
4	4	1	5	" "
5	6	1	6	" "
9	7	1	8	" "
Totals	54	10	58	

CONCLUSIONS

From the results obtained in this experiment, it seems that a solid, lasting immunity is conferred by administering serum and virus, by the simultaneous method, to pigs when three weeks of age if farrowed by and suckling immune sows. It also seems that pigs under these conditions have sufficient immunity to protect them against the injection of one cc of very potent virus and that after this virus-alone injection they are permanently immune. The immunity which the pigs had prior to vaccination in no way prevented the conferring of a solid, lasting immunity whether vaccinated by the simultaneous method or virus alone.

When the simultaneous treatment is administered to pigs three weeks of age, ten cc of serum at $1\frac{1}{4}$ cents and one cc of virus at two cents makes the cost for material $14\frac{1}{2}$ cents per head. If the follow-up treatment is used to produce the same results with the scale of dosage I have given, figuring on two treatments, which is the minimum number used in this method, ten cc of serum alone and twenty cc of serum with one cc of virus in the final treatment, makes the cost $39\frac{1}{2}$ cents per head. In the virus-alone treatment, in which we used one cc of virus with results as satisfactory as those obtained from using the simultaneous method, the cost per head is two cents. This last method, due to difference in expense may, under certain conditions, find a place in the list of methods of immunizing swine against cholera and may furnish one of the cheapest means of accomplishing the end desired.

The question is now, how much evidence of this nature must be secured before we are justified in changing methods in general practice. Hog cholera breaks are among the most disagreeable experiences that the practitioner can have. It is impossible to cover individual cases which may be met in swine practice. There are almost numberless conditions to influence one in choosing the method or methods of immunizing a herd against cholera. A knowledge of the various methods and of the experiments and experiences which originated and established them are necessary.

On the strength of the results obtained by Pickens, also Niles and Rietz, and the experiment just given, we are proceeding with caution to vaccinate young pigs by the simultaneous method and with virus-alone. However, it is only in our own herd, and with the consent of an owner who can be made to understand the situation, that this is being done. It is by proceeding under such circumstances that we hope to be able to learn the true worth of the methods which give promise of lowering the cost of immunizing young pigs against hog cholera.

REFERENCES

- ¹Cahill, E. A.: (1919) Jour. Amer. Vet. Med. Assn., liv, n s. 7 (4), p. 314.
²Birch, R. R.: (1919) Cornell Vet., ix (2), p. 91.
³Idem (1923) Cornell Vet., xiii (2), p. 168.

WATCH OUT FOR JOHNE'S DISEASE

Johne's disease is gradually spreading throughout the United States. It is apparently far more prevalent than was formerly supposed. Dr. B. A. Beach, of the University of Wisconsin, has received post-mortem material from twenty veterinarians in seven different states. The diagnosis of this disease can be definitely determined by the use of "Johnin." The Bacteriological Department is supplying veterinarians with this material for diagnostic purposes. Dr. Beach has tested 300 head of cattle in sixteen different herds, finding seven reacting to the disease. Only two of these herds had been tested before. Material sent to the laboratory this year has revealed eight cases in Wisconsin cattle. As the traffic in pure-bred cattle increases, it is obvious that more attention must be paid to this disease. Its slow progress and insidious nature does not readily alarm the owner, as would be the case with a more acute disease, and veterinarians should be on the look-out for it, in beef as well as dairy cattle.

THE A. V. M. A. AND INFECTIOUS ABORTION OF CATTLE

By WARD GILTNER, *East Lansing, Mich.*

Dean of Veterinary Medicine, Michigan Agricultural College

No dangerous infectious disease of man or the lower animals has ever been successfully controlled or eradicated except after the establishment of an enlightened public opinion. Bovine infectious abortion will be no exception to this rule. An educational campaign should be launched by the American Veterinary Medical Association against this disease. Such a campaign, to be successful, must be based on facts and an intelligent interpretation of such facts. No attempt should be made to put across a program not firmly established on experimental and observed fact.

The Association should adopt a policy of employing the organs already in existence to inform the live stock owners and veterinarians of the facts concerning bovine infectious abortion and of the measures that should be adopted respectively by each group to utilize these facts in a practical plan for attacking the disease.

As respects the live stock owners I believe that they can be reached by authoritative statements emanating from the Association, covering in intelligible language the points that these men should know. Such statements might well reach the live stock men through the medium of the public press, agricultural press, experiment station and agricultural extension publications and especially through papers prepared by the state veterinary colleges and live stock sanitary authorities of the various states. Such statements should deal with facts and their proper interpretation; they should be hopeful but conservative; they should state the seriousness of the situation but should not tend either to discourage or to make light of the case. The live stock owner should be impressed with the idea that the control of this disease is a problem that can be solved, not by legislation or regulations, not by public officials or inspectors, but by himself heartily and intelligently cooperating with his local practicing veterinarian.

The part to be played by the veterinarian is crucial. In the first place much dependence now rests and will continue to rest on those engaged in patient, painstaking and costly research on

this disease. Their responsibility lies not only in getting results as rapidly as possible but also in assisting in interpreting those results and in refraining from releasing matter that is misleading, confusing or inaccurate. Steps should be taken to provide liberally for further research on the nature of this disease. Veterinary education should adequately appraise its responsibility in the matter of training men *in curriculo* and *extra curriculo* to serve animal husbandry and thus mankind. There can be no control of bovine infectious abortion or of any other disease of such insidious and protean aspects in the absence of a highly educated and nobly inspired body of men who keenly sense their responsibilities. Therefore there is reason to view with alarm the lack of incentive for veterinary education, and one will fail to find any solution for the abortion problem outside of a re-awakening of interest in more vigorous and still higher type of veterinary college training with generous governmental backing.

Very little is to be expected at the present time from federal, state or local governmental interference, through legislation or regulation, although careful steps in this direction must be taken. The great hope rests on the private practitioner. Bovine infectious abortion can be measurably suppressed through and only through the efforts of the well trained, alert and tactful veterinarian who is willing to identify himself with a community and to cooperate with the live stock owners in solving their problems. There is no better way of reaching the live stock owner with the facts of abortion disease and with the plan for controlling it than through the local practitioner. Steps should be taken to insure a continuing supply of well trained practicing veterinarians, to assist those already in practice to meet their responsibilities and no movement should be tolerated which tends to weaken the position of such men in their communities.

An outline for the control of bovine infectious abortion can be undertaken most conveniently if we consider three possibilities in so far as herd infection is concerned; the non-infected herd, the mildly infected herd and the badly infected herd. In combatting this disease the herd must be the unit for consideration—not an individual or a group of individuals in the herd.

Obviously it is first necessary to determine into which class a herd falls. It is probable that the owner with or without the advice of his veterinarian will conclude that his herd is non-infected in the absence of any reasonable suspicion of the

presence of the infection. There can be no objection to this conclusion so far as the protection of this herd is concerned. It is only in the purchase of animals from such a herd that more conclusive evidence of the true status of the herd is essential, or perhaps in case of the introduction into such a herd of non-infected susceptible animals. The serum tests are the best means of determining the exact condition of the herd as respects infection with *Bact. abortus*. No bovine animal should be introduced into a non-infected herd until it is shown by serum tests that such animal is free from infection, and no bull should be used to breed animals in this herd unless the bull is known to be free from infection as determined by serum tests and known to be used only on non-infected cattle. Animals in the non-infected herd should not be pastured with animals not known to be free from infection. Of course there should be no occasion for using serum, vaccines or bacterins.

The distinction between a mildly and a badly infected herd may not be made dogmatically or categorically, but there is a distinction and it is of value to undertake to make it in the treatment of herds affected with infectious abortion. These classifications represent tendencies rather than states. The mildly infected herd is one, perhaps without regard to the percentage of animals involved, in which there is a favorable outlook for the suppression or eradication of the disease with the application of a rational plan of treatment. The badly infected herd is one in which there is a tendency for unfavorable conditions to persist or to become aggravated. Obviously it is only by studying the condition of the herd and by applying a system of treatment that one can come to a conclusion as to the status of the herd. The line of treatment for the two types of herds is at variance in certain important respects and it is important that procedures adapted only to the treatment of a badly infected herd should not be applied to the mildly infected herd. Difficult as it may seem, therefore, to make the distinction, no effort should be avoided to make it.

Mildly infected herds should be treated according to the degree of infection and value of infected animals. In the first place, by repeated serum tests, the condition of each animal should be recorded. If only one or a very few animals are found to be infected it may be desirable to dispose of them to the butcher or they may be put into a badly infected herd. In any case they must be isolated so as not to spread the disease

to the rest of the herd. If a large number is infected, reasonable isolation, sex hygiene and stable sanitation must be practiced and blood tests continued on the entire herd to determine whether the disease is spreading or being suppressed. In the former case it may be necessary to treat the herd as a badly infected herd, in the latter case treatment may be as indicated above for non-infected herds. No new animals should be introduced into the mildly infected herd until it has been determined what the outcome of the treatment is to be. If the infection is at the point of complete suppression, the herd may be treated as in the case of the non-infected herds; while if the disease continues to spread, it may be wiser to consider it as a badly infected herd in respect to the introduction of animals. Animals may be sold from the mildly infected herd to go into the non-infected herds only when repeated serum tests have shown the absence of infection. Vaccines (the only biological preparations worth considering in a pure *Bact. abortus* infection with our present knowledge of their action) should not be used if it is hoped to eliminate the infection from the herd. If vaccines are used the herd may as well be classed and treated as a badly infected herd.

The badly infected herd may be attacked from many angles. As has been done repeatedly it may be disposed of by the sale for slaughter or by dispersal. The latter method is permissible only if the animals are to be introduced into badly infected herds except in case of members of the herd that are proved by serum tests to be free from infection. Such animals may be sold as free from the disease but coming from a diseased herd. If it is not hoped to eliminate the infection from the herd but only to reduce the number of abortions, then and only then may live cultures (vaccines) of *virulent* bacteria be employed. It must be expected that in this case all serum-testing will be greatly interfered with.

It appears to us that the secret of success in the use of biologics for the prevention or control of infectious abortion lies in a study of the development of so-called vaccination against typhoid fever. While the very successful typhoid vaccine, so-called, is in reality a bacterin or dead culture, the key to its success lies in the strain of *B. typhosus* utilized, I believe, first by Sir A. E. Wright. Not any or every strain of *B. typhosus* is agglutinable or able successfully to protect against typhoid fever. It is reasonable to expect that not any or every strain of *Bact. abortus* will (assuming that the general proposition is inherently possible)

protect against infectious abortion. It has occurred to us that, since dead cultures or bacterins have thus far signally failed to meet the needs of either a protective or curative treatment, the problem consists in the selection of a living strain possessed of high antigenic and low or no pathogenic properties. Furthermore, its antigenic properties must partake of the nature of antigenesis in the sense of stimulating the production of protective antibodies, not simply antibodies, agglutinins and complement-fixing, for instance. In our laboratory Huddleson has been working for some time with what, we feel, is such a culture. He will announce his results in due time.

If vaccines in their present state of development are used, no further steps should be required except that isolation, sex hygiene or stable sanitation should be practiced at the time of calving and abortions, especially in order to prevent sterility and complications. There is very little evidence to show that the bull need be considered except from the standpoint of potency and presence of other infections. If it is hoped to eliminate the disease from the herd the problem is serious and partakes of the nature of a long campaign. As in the case of the non-infected herd and the mildly infected herd, but especially in this case, success depends absolutely on the services of the well trained, practicing veterinarian. There are no hopeful recommendations in the absence of the well qualified practitioner who is *en rapport* with his client.

By means of clinical observations, serum tests and other laboratory aids the true condition of the herd should be determined from time to time. Eliminate all unhopeful or permanently non-productive animals from the herd. Isolate, as far as facilities will permit, all animals that can be shown to be spreaders of *Bact. abortus*, or other infective agents, especially when they are actively and grossly spreading the disease, as at parturition or abortion. Practice rigid sex hygiene and stable sanitation but always within reason and for a purpose other than to be doing something. Introduce no non-infected animals into the herd unless it be essential for breeding purposes. Keep the bull sexually clean by mating with sexually clean cows. Sell only infection-free animals, except for immediate slaughter, or infected animals only to infected herds.

In herds where abortion and its complications exist and where a system of laboratory tests fails to indicate the presence of *Bact. abortus* there is presented a problem just as serious and

one in which every known precaution based on the bacteriology of infectious diseases should be taken to prevent the spread and to eliminate it.

The American Veterinary Medical Association has generously and intelligently supported the study of bovine infectious abortion. It should continue to do so in cooperation with the United States Live Stock Sanitary Association, or any other agency willing and able to cooperate. It is gratifying to note that at the recent meeting in Montreal the Association went on record as endorsing its previous actions and as pledging itself to further efforts. The report is brief and worthy of inclusion in this paper.

"Your committee has had two meetings in the course of the year, at which all questions pertaining to bovine infectious abortion were carefully discussed. It was found during the discussions that nothing radically new, or of real importance, has been discovered since the last report of the abortion committee was presented that could be added to previous reports, or that makes a revision of the statements made in previous reports necessary.

"The very nature of bovine infectious abortion is such that rapid acquisition of knowledge regarding it cannot be expected, and your committee, while it recognizes the great importance of placing every newly discovered fact before the Association without delay, together with the significance it may have, does not believe that it is desirable to present a lengthy report unless it can impart something that may have real value in the sense that it is something which has not become generally known, or in the sense that it is serviceable for the rectification of existing beliefs.

"Owing to the great importance of infectious abortion, your committee recommends that a committee on the subject be kept in existence, particularly as many investigations are now in progress and have been planned, the results of which, as soon as they are available, should be imparted to the Association."

KANSAS VETERINARIANS PLAN BIG MEETING

The twentieth annual meeting of the Kansas Veterinary Medical Association will be held in conjunction with the Third Annual Conference of Kansas Veterinarians, in the Veterinary Department of the Kansas State Agricultural College, at Manhattan, February 6-7-8, 1924. Besides a number of Kansas practitioners and the members of the K. S. A. C. Veterinary Faculty who will participate in the program, the following veterinarians from outside the state will contribute: Drs. A. T. Kinsley and F. F. Brown, of Kansas City, Mo.; Dr. E. C. Schroeder, B. A. I., Bethesda, Md.; Dr. W. L. Boyd, of the University of Minnesota; Dr. H. Preston Hoskins, Secretary-Editor of the A. V. M. A., Detroit, Mich.

INDOLENT ULCER OF GLANS PENIS SUCCESSFULLY TREATED BY ELECTROCOAGULATION

By C. C. PALMER, Newark, Del.

Delaware Agricultural Experiment Station

The bull shown in the accompanying photograph developed an indolent ulcer upon the right side of the glans penis about one inch from the free end of the organ, which seriously interfered with his ability to breed. The case was under treatment throughout a period of several months, but no improvement resulted until electrocoagulation treatment was given, which induced complete recovery. As electrocoagulation is somewhat new in veterinary practice and as considerable difficulty was encountered



The Subject of the Operation

in securing the penis, for the purpose of applying the treatment, this case is being reported in the hope that others encountering similar cases may be benefited somewhat, as a result of our experience.

The cause of the ulcer was not established. The bull was away from home at the time the ulcer made its appearance. Later when the breeder leasing the bull was questioned about the case he stated his veterinarian had examined the bull and thought the trouble had been induced by the use of "too strong" antiseptic solutions in irrigating the prepuce. Examination of the bacterial flora of the prepuce revealed a mixed type of infection,

and no single species of bacteria was incriminated as the specific cause. It is quite probable that the "too strong" antiseptic douches acting as a chemical irritant paved the way for pathogenic bacteria normally present in the prepuce, but which cannot attack normal healthy tissue.

The diseased penis did not interfere with the desire of the animal to copulate. His services were prompt, and the spermatozoa were ejaculated in normal numbers. The only noticeable symptom was a slight hemorrhage that commenced at the time of erection, and which was augmented greatly by the act of copulation. After dismounting from the cow the blood ran in a small stream from the glans penis. The hemorrhage would stop shortly after the sexual excitement passed away.

Extreme difficulty was encountered in making a close inspection of the penis. The animal would not permit manual exploration, neither would he protrude the penis from the prepuce where it could be viewed, except for a very short interval before and after serving a cow. At such times inspection revealed an ulcer about one-half inch long, and three-eighths of an inch wide, located on the right side of the glans, near the free extremity.

The animal was retired from service and the prepuce irrigated daily with a mild, non-irritating, antiseptic solution. During the course of this treatment, several antiseptics were employed. Included in the list were chlorine, coal-tar and silver preparations. Each preparation was given a thorough trial. Those employed in solution in water were permitted to enter the prepuce by gravity, through a gum horse-catheter. After passing the catheter into the prepuce as far as possible, the preputial orifice was closed by means of the hand, and the antiseptic solution thus retained within the preputial cavity for a period of several minutes. Chlorine compounds in oil (dichloramine-T in chlorcosane 2.5%) were administered by means of a dose syringe.

Progress in the treatment was tested from time to time, by presenting a cow in estrum to the bull, but not permitting service, and noting the presence or absence of hemorrhage when the penis became erected. The antiseptic treatment, although employed throughout a period of several months, failed to improve the case, and it was decided to treat the ulcer directly with a cauterizing agent.

Great difficulty was encountered in securing the penis for the purpose of cauterizing the ulcer. It was impossible to secure the penis, and withdraw it from the prepuce with the bull in the

standing position. Casting the animal, by means of a side-line with hobbles on all four feet, also failed. This method of restraint might have proven successful if the animal had been placed under a general anesthetic, but the owner objected to this. While in the hobbles the bull fought tenaciously, but nevertheless it was possible to introduce the hand into the prepuce and grasp the penis. With an assistant working behind the animal, and pushing forward on the penis at the S-shaped curve, the penis was delivered within about one inch of the preputial orifice. At this stage, when it seemed the penis was about to be delivered, the animal would forcefully retract the organ into the deep recesses of the prepuce.

Following this unsuccessful attempt in securing the penis, three plans of procedure were considered: 1st, operating under complete chloroform anesthesia; 2nd, section of the retractor penis muscle under local anesthesia; 3rd, providing a window in the posterior part of the prepuce through which it would be possible to bring the penis to the outside. As the patient was an exceptionally valuable animal, the question of method of securing the penis was considered very carefully. The writer favored proceeding under general anesthesia, but after talking with the owner and his superintendent of cattle, plan number three was decided upon. As securing the animal with hobbles had not proven entirely satisfactory, an operating table was constructed. This proved to be a much better method of restraint.

Several weeks elapsed between the discontinuation of the antiseptic treatments and the cauterizing of the ulcer by electrocoagulation. During this period of absent treatment there was no improvement in the case. The bull was placed upon the operating table, and as previous attempts to withdraw the penis, with the animal securely tied upon the table, had failed, a vertical incision a short distance anterior to the rudimentary teats was made through the prepuce under local anesthesia, and a window thus provided. With the right hand and forearm introduced into the preputial cavity, entering through the preputial orifice, and an assistant pushing the penis forward at the S-shaped curve, the penis was secured and directed through the artificial opening in the prepuce.

After securing the penis in this fashion, no difficulty was encountered in holding the organ while the ulcer was being treated by electrocoagulation. The treatment was applied

after the method of Pfahler and as described by Da Costa,* "consists in the destruction of all malignant disease by means of high frequency electric current either of the Oudin or d'Arsonval type of current. It differs from the destruction of disease by the thermocautery in that this heat is generated in the tissues due to the resistance to the flow of the electricity through the tissues, instead of destruction by transmitted heat such as applies to the use of the thermocautery. It has the advantage, therefore, over the thermocautery, of producing heat at a much greater depth, and in a more graded proportion. It applies the principal of the Percy cautery in producing a zone of tissue in which there is sufficient heat to destroy malignant cells but not normal tissue cells beyond the area of actual destruction of all tissues. In the area of coagulation all tissues are, of course, destroyed."

Examination of the ulcer at the time of operating revealed it to be oval in outline three-fourths of an inch long and about three-eighths of an inch wide. It was a dirty-gray color, and had penetrated into the urethra. The surrounding tissue appeared normal, there being no apparent general inflammation of the glans.

After cauterizing the ulcer, the penis was returned to the prepuce and the artificial opening closed by interrupted sutures. The suturing of the incision was unnecessary and probably not advisable. Better drainage would have been provided, if the wound had been permitted to heal by secondary intention. Healing was apparently prompt, and except for the formation of a small superficial abscess which necessitated early removal of the sutures, no difficulties were encountered.

Following the electrocoagulation the ulcer completely healed, and in about two months the bull returned to service. The animal has been in service for more than a year and at no time since the operation has hemorrhage occurred during the act of copulation.

The writer is greatly indebted to Dr. W. H. Kraemer, who suggested and applied the electrocoagulation treatment.

The Epsilon Chapter of Alpha Psi Fraternity held its annual smoker for freshmen, in the School of Veterinary Medicine, University of Pennsylvania, the latter part of October.

*Electrocoagulation in the Treatment of Malignant Disease, Da Costa, Modern Surgery, W. B. Saunders Co.

CARRIERS OF BANG ABORTION BACILLI AND THE AGGLUTINATION TEST

By E. C. SCHROEDER and W. E. COTTON

*Experiment Station, U. S. Bureau of Animal Industry,
Bethesda, Md.*

We have long believed, and our belief has been shared by others who have studied the subject, that it may be possible to distinguish, by means of the agglutination test for bovine infectious abortion, between reacting cattle that are and those that are not carriers of Bang abortion bacilli.

After having made many agglutination tests, followed by a careful search in the bodies of reacting animals for abortion bacilli, we have in no instance discovered a bovine animal which failed to react with the test in a higher dilution than 1 to 100 which we could prove to be a carrier of abortion bacilli.*

In this connection the following study on the occurrence of abortion bacilli in the udders of reacting cows is interesting and instructive.

Milk was obtained from 56 reacting cows, all members of one large dairy herd in which bovine infectious abortion has existed for sometime. The milk from each quarter of the udder of each cow was drawn separately and injected separately into the abdominal cavities of two guinea pigs. In this manner, as some of the cows were producing milk with only three quarters of their udders, and as milk from some of the cows was obtained and tested on 2, 3 and 4 different days, the actual number of guinea pigs injected with milk from each cow varied from 6 to 32. The reason for keeping the milk of the different quarters of the udder separate, as it is well known that only one quarter of an infected cow's udder may harbor abortion bacilli, was to prevent the dilution of the milk from a possibly infected quarter with that from one, two or three uninfected quarters.

Among the 56 cows 30 reacted with the agglutination test in dilutions of 1 to 200 or higher, and 26 reacted with dilutions no higher than 1 to 100.

*The terms we use in speaking of the agglutination test, such as a dilution of 1 to 100, or 1 to 200, mean, in each case, that the amount of blood serum added to a definite amount of a standard suspension of abortion bacilli compares with the amount of the suspension as the first or lower figure compares with the second or higher figure. Thus, in a 1-to-100 reaction one part of serum is sufficient to agglutinate the bacilli in 100 times its volume of suspension, and in a 1-to-200 reaction one part of serum is sufficient to agglutinate the bacilli in 200 times its volume of suspension. In our agglutination tests for bovine infectious abortion the total amount of fluid in each test tube is 2 cc.

Counting the milk obtained from the 3 or 4 quarters of any cow on any one day as a single sample, though the milk from each quarter was secured and handled separately, the total number of samples from the 26 low-reacting cows was 61, which were injected into the abdominal cavities of a number of guinea pigs of which 476 afterwards lived long enough for the lesions caused in guinea pigs by the Bang abortion bacillus to develop. On post-mortem examination not one of the 476 guinea pigs showed abortion bacillus lesions. The blood of some but not all of the guinea pigs was subjected to the agglutination test, and in no instance showed the least sign of a reaction.

Again, counting the milk obtained from the 3 or 4 quarters of any cow on any one day as one sample, though the milk from each quarter was secured and handled separately, the total number of samples from the 30 high-reacting cows was 49, which were injected into a number of guinea pigs of which 342 afterwards lived long enough for the lesions caused in guinea pigs by the Bang abortion bacillus to develop. The post-mortem examinations of the 342 guinea pigs supplied irrefutable evidence to prove that 25 of the 30 high-reacting cows, or $83\frac{1}{3}\%$, harbored abortion bacilli in their udders.

As the 56 cows from which the milk was obtained were all members of the same herd, we may assume that they had all been exposed to the same strains of the abortion bacillus. If the high-reacting cows had been members of other herds than the low-reacting, the absence of lesions in the guinea pigs injected with the milk from the latter would be open to the question whether the strains of abortion bacilli responsible for the low reactions were of a kind that lacked pathogenicity for guinea pigs.

While we are not ready to say definitely that a cow is not a carrier of abortion bacilli unless she reacts with the agglutination test in a dilution higher than 1 to 100, the fact that not one among 26 low-reacting cows was proved a carrier with tests which proved 25 among 30 cows, which reacted with dilutions of 1 to 200 or higher to be carriers, is quite impressive, particularly if it is noted that 12 more samples of milk from the smaller number of low-reacting cows were tested than from the high-reacting cows, and that the number of guinea pigs which served to test the milk from the low-reacting was 134 greater than the number which served to test the milk of the high-reacting cows.

To the presented data we could add many additional tests with milk from cows of a number of different herds, which showed

the frequent occurrence of abortion bacilli in the milk of high-reacting and their absence from that of low-reacting cows.

The determination of the maximum dilution in which the serum of a cow agglutinates a suspension of abortion bacilli requires, and there should be no variation from this, that at least two tests, with an interval of a month or more between, must be made. Unless the two tests are made, a beginning reaction may erroneously be recorded as a true low reaction. If the second or later test, in any instance, shows a stronger reaction than the first or earlier, it must be interpreted as signifying that the cow has recently become infected or has been reinfected, and that she is more likely to be dangerous than safe.

If the agglutination test for bovine infectious abortion is or can be made serviceable to distinguish with certainty between safe cows which, though they have been exposed to infection, and may have aborted, and may show some reaction, and dangerous carriers of abortion bacilli, it would tend greatly to reduce the difficulties that must be overcome in attempts to suppress the abortion evil through the use of sanitary measures.

MEAT AND MILK INSPECTION TO BE FEATURED

The Veterinary Division of the Michigan Agricultural College has arranged to conduct a Short Course for Veterinarians, at East Lansing, January 28 to February 1, 1924. Particular attention will be given to meat and milk inspection, poultry diseases and the diseases of breeding cattle. Dean Giltner will be assisted by the members of his faculty and a number of well-known experts, including Dr. H. H. Sparhawk, Chief Veterinarian, Detroit Department of Health; Dr. Wm. H. Price, Sanitarian, Detroit Creamery Company; and Dr. T. S. Rich, B. A. I. Inspector in-charge-of Tuberculosis Eradication Work in Michigan.

WESTERN PENNSYLVANIA VETERINARY CLUB

The Western Pennsylvania Veterinary Club held its regular meeting on November 31st, at Pittsburgh. Dr. C. J. Marshall, of the University of Pennsylvania, addressed the meeting on the subject of "Sterility." The Club voted to hold monthly meetings in the future.

VETERINARY EXTENSION AT THE UNIVERSITY OF PENNSYLVANIA

Veterinary Extension was inaugurated at the University of Pennsylvania three years ago. Its primary purpose is to render to practising veterinarians a service similar to that rendered to farmers, live stock growers and dairymen by Agricultural Extension. This was adopted as the first objective because it was believed that agriculture and the live stock and dairy industries could be better served by furnishing information regarding advances in veterinary medicine to those men who had a basic training in that subject, than to attempt to give instruction along these lines to farmers, live stock owners and dairymen directly. At the same time, however, it was decided that no opportunity should be neglected to furnish information regarding sanitation and hygiene to those whose success and prosperity depend largely upon maintaining their animals in the highest state of efficiency.

Doctor George H. Hart, of the University of California, who was on a year's leave of absence from that institution, was selected to take charge of the work, with the title of Supervisor of Veterinary Extension, and devoted his entire time to the subject. One of his first acts was to establish the University of Pennsylvania Veterinary Extension Bulletin, which is published quarterly.

Dr. Hart next visited veterinarians throughout all parts of Pennsylvania to ascertain, if possible, their needs. He also attended the various meetings of veterinarians of Pennsylvania. Many valuable suggestions were obtained in this way. While making these visits, he got in touch with the principals of vocational schools and made arrangements to address the agricultural students on the subject of veterinary education.

These young men in this way obtained a correct and probably, in many instances, an entirely new viewpoint of veterinary medicine, which no doubt will react to the benefit of the profession and the live stock interests of the state.

The work done by Dr. Hart during the year was invaluable in establishing Veterinary Extension in Pennsylvania and it was greatly regretted that he could not be induced to continue the work.

Dr. G. A. Dick, Professor of Animal Industry, a member of the Veterinary Faculty, was then made Supervisor of Veterinary Extension. The appropriation for the following two years was reduced and it became necessary to alter the plans of carrying on this activity.

It was at first proposed to gather the veterinarians in groups at convenient and easily accessible points, and then give the lectures and demonstrations for which they expressed a desire. As the plans were developed, however, it was realized that the organization of veterinarians in local clubs in all parts of the State had already brought about the best grouping of practitioners that could be made. It was then thought best to conduct veterinary extension through these groups.

Each group was informed that any member of the Veterinary Faculty would respond to an invitation to address them on any subject he taught. This was to be done without any expense to the veterinarians. They responded with a great deal of enthusiasm, and members of the faculty have given lectures or demonstrations to these groups as often as they could arrange to get together.

After the work had been conducted in this manner for two years, with its popularity increasing during that time, the Dean of the Faculty, desiring to increase the efficiency of veterinary extension, conceived the idea of presenting well rounded courses of study which might be comparable to post-graduate courses. As a result, the following seven courses were outlined:

1. Diseases of the Alimentary Canal of Cattle.
2. Diseases of Swine.
3. Diseases of the Genital Tract of Cattle.
4. Diseases of Small Animals.
5. Diseases of Poultry.
6. Diseases of the Udder of Cattle.
7. Diseases of the Respiratory Tract of Cattle.

The following is an example of one of the courses as outlined:

Subject: Diseases of the Alimentary Tract of Cattle.

1. Anatomy—demonstrated on fresh, green viscera.
2. Physiology.
3. Pathology.
4. Peculiarities of Drug Action on Bovines. (Drugs acting on the alimentary canal).
5. Medicine. (Etiology, diagnosis and treatment).
6. Surgery.

7. Feeding.
8. Dairy Farm Sanitation.
9. Judging Dairy Cattle.

This plan is now being tried out in seven sections of the State, with as many groups of veterinarians. The plan was first submitted to each group for their approval and for suggestions. Each group had the privilege of selecting the course in which it was most interested. It was soon found, as was anticipated, that the needs of veterinarians varied in different parts of the state. The following list shows the course selected, and the number of groups selecting each course:

<i>Course</i>	<i>No. of Groups</i>
Diseases of the Alimentary Tract of Cattle.....	3
Diseases of Poultry.....	2
Diseases of Genital Tract of Cattle.....	1
Diseases of Swine.....	1

One member of the Faculty meets a group each month. The lectures are arranged in such a way that the work does not interfere with the regular duties of the teaching staff.

If this plan works out satisfactorily this year, it is hoped to extend it the coming year, so that every veterinarian in Pennsylvania can avail himself of the opportunity to obtain advanced work in veterinary medicine.

In the meantime the Veterinary Extension Bulletin is being published regularly and is mailed to each veterinarian in the State.

BULLETIN ON FARM SANITATION

"Farm Sanitation" is the title of Extension Circular No. 138, issued by the Extension Service of the South Dakota State College, at Brookings. This is really a bulletin of forty pages, and was prepared by Dr. G. S. Weaver, Extension Specialist in Animal Diseases. The publication contains a great deal of valuable information in very convenient form, including excerpts from the regulations of the South Dakota State Live Stock Sanitary Board, relative to the disposition of carcasses of dead animals, requirements for the shipment of live stock, quarantines, etc.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

DICEPHALUS BISPINALIS TRICHIRUS

By KNOWLTON REDFIELD, *Brookings, S. D.*

Animal Health Laboratory, South Dakota State College.

The above monstrosity was brought to the Animal Health Laboratory of South Dakota State College, May 5, 1923, by the owner, who gave the following history of the case. The animal was out of a Duroc-Jersey sow and by a boar of the same breed. It was the fourth in a litter of seven pigs, appearing as a posterior presentation, dorso-sacral position. The heads apparently became lodged under the brim of the pelvis, as only the rear pedal extremities could be seen and delivery was finally affected by the owner, only after considerable traction had been applied. The animal was delivered dead, the pigs both preceding and following it all being normal and alive. The sow's history was negative, though the boar was the sire of another litter on the same farm, one of which was also a monster, having, as the owner expressed it,—“no face, but a trunk like that of an elephant”. Unfortunately we did not get a chance to examine the latter monster as the owner had “thrown it to the dog” that morning.

HISTORY OF MONSTROSITIES

Space prevents of any but a very brief consideration of such monstrosities. Suffice it to say, aside from the superstitious ideas concerning this formation, which are unworthy of note, that Regis started the hypothesis that the germs of these monstrosities must have been originally produced with those of normal beings and that they were developed in the ordinary course of generation. This or a similar hypothesis was accepted by Winslow, Duvernoy, Haller, and others up to the time of Meckel. Geoffroy Saint-Hilaire, however, successfully combatted it and demonstrated that these anomalies in organization are not primary, but accidental; that had they been placed in ordinary circumstances, would have developed normally, but had only become anomalous because their development was disturbed.

The opinion at present prevailing with respect to these malformations is to the effect that the embryo or fetus has been subjected to some kind of alteration *in utero* and that this has been produced during the interval between conception and birth.

DeLee, Mall and Ballontine refer to the effect of external agencies on the formation of monstrosities. Among such influences they cite injury to the abdomen or uterus, diseases of the uterus, chorion (Mall), and amnion. Abnormal implantation of the ovum as in the tube (Mall), arrest of development and changes in the ovum during the blastula or morula stages, the result of thermic, chemical or physical action. It has been proved that lithium, sodium, potassium and magnesium have a special selective action on various cells of the morula, producing char-

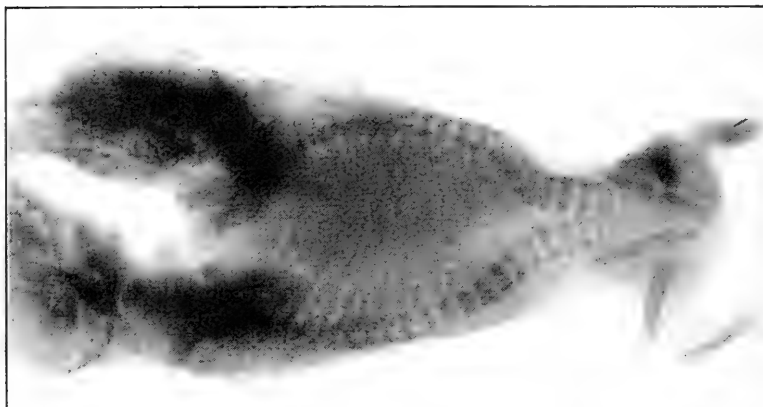


Fig. 1. X-Ray Plate of Case

acteristic monsters. Some of the poisons affect the nervous system and others the heart. It is well known that shocks and deprivation may produce vascular and nutritional disturbances, general and local in the endometrium, which may seriously affect the growth of the ovum.

Among the internal causes may be mentioned: heredity, defective spermatozoa, etc.

ANATOMICAL DESCRIPTION OF MONSTROSITY

The animal has a double head and neck. Heads are normal with the exception of the left branchial cleft of the left head, which failed to close, forming a typical cleft palate. The necks are normal and join just anterior to the thorax. There are three anterior limbs, fully developed, one of which is situated more or

less on the dorsal surface of the thorax. This limb appears to have started as two individual appendages but which fused very early in fetal life.

As can be seen from the accompanying X-ray plate, the left half is slightly turned medially upon its fellow. The ribs, of which there are fifteen pairs in each half, a total of thirty pairs, can be seen to interlace to some extent. The cervical, thoracic and lumbar, as well as the first two sacral vertebrae are separate and distinct in each half of the individual. There is but one third and one fourth sacral vertebra. Posterior to this the coccygeal vertebrae are again double, the latter forming two distinct and individual tails.

The posterior limbs are normal as to both number and anatomical formation. There is but one rectum and one female genital opening. As stated previously there are two mammary systems and one umbilicus.

PHYSIOLOGICAL DESCRIPTION OF MONSTROSITY

As can be seen* from the X-ray plate, there is a shadow of but one heart.

Due to constriction of the tissues, I was unable to inject barium per os into this animal. This was, therefore, injected per rectum with a syringe and female (human) catheter to determine by subsequent X-ray whether there was more than one stomach or intestinal tract, and if this were so to determine at just what place anterior to the rectum they join. This was done successfully and as can be seen from "barium" X-ray plate there is but one stomach and one intestinal tract.

It is to be regretted that more monstrosities are not reported as there is much that can be learned from them from an anatomical, physiological and embryological standpoint.

TEST THE CALVES

Numerous cases have been reported indicating that tuberculosis frequently exists in very young calves. This being the case it is very important not to overlook the testing of calves in tuberculosis control or eradication work. The intradermic test is the test of choice for young calves. Regulation 7 of the Bureau of Animal Industry requires that all calves intended for interstate shipment, regardless of age, must be tested and accompanied by an interstate health certificate and tuberculin test chart.

REVIEWS

LIVESTOCK SANITATION. W. H. Dalrymple, M. R. C. V. S., Department of Veterinary Hygiene, Louisiana State University. 145 pages, with 23 full-page, half-tone illustrations. The Gladney Press, Baton Rouge, 1923. Price \$2.00.

In this little book the author has gathered together a number of short popular articles, which, with a few exceptions, have appeared as weekly contributions to the *University Press Bulletin*. In no sense technical, the material has been prepared for the benefit of stockowners, and to these people, with whom he has been associated for over thirty years in Louisiana, Dr. Dalrymple has dedicated this unpretentious volume.

The book is divided into nine sections, dealing respectively with (I) Food, (II) Water, (III) Air and Ventilation, (IV) Soil, (V) Disposal of Animal Excreta, (VI) Disinfection, (VII) Microbic and Parasitic Diseases, (VIII) Mistreatment of Livestock, and (IX) Miscellaneous.

Whenever a veterinarian attempts to write a book, intended primarily for the lay reader, he enters upon a difficult task. However, the author's long experience in this particular field has made the task easy, and we do not hesitate to pronounce the book "safe." We hope that it will have a wide distribution.

LES MALADIES DU MOUTON (Diseases of Sheep). By Prof. G. Moussu, l'École Vétérinaire d'Alfort. 332 pages, with 114 figures and 8 colored plates. Vigot Frères, Paris, 1923. Price 20 francs.

The fact that sheep-raising is suffering a marked decline in France was undoubtedly a very important reason for the preparation of this book. In the foreword the author gives statistics, showing that the ovine population in France has fallen off to less than ten million head, from over twice this number in 1898 and from over thrice the present number in 1875.

Diseases of lambs are discussed in the first part of the book, some fifty pages being devoted to these ailments, divided into three groups: the first comprising diseases of microbic origin; the second, those of digestive origin or of undetermined cause; the third, those of parasitic origin.

The balance of the book is devoted to the diseases of adult sheep. These are taken up and discussed in a systematic order. Seventeen pages are devoted to various methods of castration. The author appears to have covered the subject of sheep dis-

eases very thoroughly, and the book undoubtedly merits a very cordial reception upon the part of practitioners wherever sheep are raised.

ABSTRACT

SPEZIFISCHE INFEKTIOSE PNEUMONIE BEIM FOHLEN. EIN NEUER EITERERREGER BEIM PFERDE. (Specific Infectious Pneumonia of Foals. A New Pyogen in the Horse). Hilding Magnusson. Arch. f. Wiss. u. Pract. Tier. 50 (1923), 22-38.

The author describes a new disease of colts occurring in Sweden. Literature is quoted to show that the disease may have been observed previously in Hungary (Schmiedehofer) and in Denmark (Adersen.) Twelve field and several experimental cases are described. Several illustrations are presented. Experimental inoculations were made with organisms isolated from the various cases in order to determine the cause of the disease. From these experiments it appears that a diphtheroid forming a yellowish-red pigment is the causative factor. The name, *Corynebacterium equi*, is proposed for this organism. This bacterium is pathogenic for foals and swine only. Its morphological, cultural and biochemical characteristics are described.

The nature of the disease is characterized by subacute or chronic broncho-pneumonia, with circumscribed abscess formations in the parenchyma of the lungs. In one case the organism was not found in the lungs but it was shown to have caused pleurisy, peritonitis and orchitis. In one case the organism was found in the joints, where it was associated with streptococci. The symptoms are: Increased and difficult respiration with abdominal breathing, occasional rattling sounds, in some cases coughing, discharge from the eyes, brownish purulent discharge from the nostrils, rapid emaciation, rough coat, temperature quite normal until later stages of disease and pulse not much affected. In the living subject the diagnosis is based on difficult abdominal breathing, discharge from eyes and nose, absence of fever and occasional demonstration of the causative organism in the discharge from the nose. No positive agglutinations were obtained. On post-mortem examination the disease is easily diagnosed by finding the thin-walled, cold abscesses in the lungs and also enlarged bronchial lymph-glands infiltrated with pus. The treatment has been symptomatic in all cases and without success.

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Sixtieth Annual Meeting, Montreal, Canada. August 27 to 31, 1923.

(Continued from p. 363, December Journal)

PRESIDENT WELCH: At this time, I am going to extend the privilege of the floor to a member of the Ladies' Auxiliary, who wishes to bring a very important matter before us. Mrs. Hoskins.

. . . The men arose and applauded. . . .

MRS. HOSKINS: Mr. President and Gentlemen of the American Veterinary Medical Association: I am not coming on a suffrage question at all, but there are many of the ladies who have found that the wives and mothers and daughters and sisters of the veterinarians have not fully understood what the Auxiliary is and what is its purpose, and we have asked the privilege of about five minutes of your time and attention to let you know just exactly what we are trying to do.

The organization is one which devotes its funds to the benefit of senior students in veterinary colleges in the United States and Canada, who wish a little assistance.

Our first loan was made last year. The rules and regulations which govern these loans are rather simple: A sum not to exceed \$350 can be loaned to any senior student each year. This student is to repay this loan, half of it two years from the date of issue; half of it three years from the date of issue, with four per cent interest. The student must be recommended by the dean of his college. He must furnish two guarantors that this sum will be repaid; his application must be signed by the President of the Auxiliary, the Secretary of the Auxiliary, the Chairman of your Executive Board, and the Chairman of your Committee on Intelligence and Education. We are guarding our funds, you see.

The funds are secured only through the dues paid by the members of the Auxiliary. Any lady, mother, sister or wife of a member of the American Veterinary Medical Association, is eligible to membership. The initiation fee is fifty cents. The annual dues are one dollar. The dues, as I say, are the only source of income. Last year we loaned \$450, \$350 to one student, and \$100 to another.

I am going to tell you about that \$100. It may give you a little better idea of what we are trying to do. In January we

had a letter from this young man, stating he had one more semester's work to finish his course. His father had met with sudden financial reverses, and he couldn't finish his course unless he had assistance.

His dean said, "Apply to the ladies." He sent his application to us. We rushed it through and the day before registration \$100 was in his hands, and he is now finishing his course.

We had a most grateful note saying that our quick response to his request had given him the opportunity to go on and finish with his class.

Will you gentlemen take the message home to the ladies of your families? Those of you who have wives and daughters with you probably have them in our Auxiliary meeting this afternoon, although there must be a number who did not get there. Will those of you whose wives are not members, carry the message to them?

We will try to have in the JOURNAL, in an early number, a written statement of the purpose, the dues and so forth, of our Auxiliary, so that you may have it in writing to present to your wives, but will you take the idea home to them? We might, I suppose, write to each one, but we don't know how many of you have wives. We have no means of knowing that. (Laughter). So we are making the appeal general and we hope you will take the message home to your wives and help us.

We have an application in now, and unless we have a number of dues paid, a number of new members, we cannot make the loan.

Will you help us? Thank you. (Applause).

. . . . The men arose and applauded. . . .

PRESIDENT WELCH: The report of the Committee on the American Research Council. Is Dr. Goss present?

Dr. Goss read the report.

PRESIDENT WELCH: What shall be done with this report?

It was voted, on motion of Dr. Murphey, duly seconded, that the report be adopted. (To be published.)

Secretary Hoskins then read a letter received from Dr. W. H. Wray, written from Beaconsfield, England, dated August 16.

PRESIDENT WELCH: Gentlemen, it is always the unexpected that happens. Scarcely was the ink dry upon his message ere he was summoned on his long journey.

Dr. Gibson then sang a song in memory of Dr. Wray.

Dr. Baker then read the report of the Committee on Necrology.

It was voted, on motion of Dr. Baker, duly seconded, that the report be adopted. (To be published.)

DR. C. D. MCGILVRAY: Mr. President and Fellow Members of the American Veterinary Medical Association: It seems appropriate, on an occasion of this kind, that some fitting reference be made to John Runyon Rutherford. We in Canada feel that through his death we have lost one of our greatest leaders, and I have been asked to prepare an obituary that might be published, dealing with his career, and making such references as we as a body might see fit to pass as a slight remembrance of that once member of this Association.

Dr. McGilvray read his prepared obituary.

Song by Miss Featherstone.

PRESIDENT WELCH: Gentlemen, the tellers have reported on the election of the vice-presidents. I will read the result. The five following members, Dr. Daubigny, Dr. Kingman, Dr. Hart, Captain Kelser, and Dr. Moore, having received a majority of the votes cast, I will declare elected to serve as Vice-Presidents during the following year.

Dr. Baker has some announcements.

DR. BAKER: I just desire one moment of your time to express to you the regret that Dr. MacEachran feels that he has not been able to be present with you at this gathering, and also the regret that he wasn't able to carry out the promises he made when he asked, in St. Louis, that as many as could spend a day at his country place. The Doctor is in a very serious state of health, and, in consequence, is not in a condition to receive any one at his residence, or come here. I assure you that Dr. MacEachran takes a very keen interest in the affairs of the American Veterinary Medical Association, and if it had been at all possible, he would have been here.

PRESIDENT WELCH: I will now call for the report of the Committee on the International Veterinary Congress.

DR. MERILLAT: Mr. President, Gentlemen: It was at my suggestion some years ago that this Committee was appointed. It seemed at that time, in 1919, that the international situation might warrant the invitation of the veterinarians of the world to reconvene a great international veterinary congress.

Since that time this Committee has been in communication with those who have to do with the reconstruction of this broken wheel in Europe. Thus far, no progress has been made, and, in view of the poor prospects of anticipating a reunion of the world

veterinarians in the United States during the next few years, I would move that this Committee be discontinued.

PRESIDENT WELCH: You have heard the motion, gentlemen. Is there a second?

The motion was seconded by Dr. Hershheim, and carried.

PRESIDENT WELCH: The report of the Committee on Legislation.

Dr. Ferneyhough read his report.

DR. FERNEYHOUGH: I do wish to say to you gentlemen that, as a member of your Legislative Committee and the present Chairman, it is all-important, when we go to Washington, to be thoroughly supported by the people back home.

Now, I want to call your attention to one thing: It is one thing to offer a bill to a legislative body; it is another thing to get the bill passed in the form you offer it. Sometimes you don't recognize your own child, and you have to be very careful after offering a bill, to see that it is not so amended as to defeat the object for which it is drawn. That is one thing we have to be careful about. (Applause.)

It was voted, on motion of Dr. A. H. Baker, duly seconded, that the report of the Legislative Committee be received. (To be published.)

DR. A. H. BAKER: Following the report made by Dr. M. C. Baker, on the illness of Dr. MacEachran. I would like to move that the Secretary be instructed to write Dr. MacEachran a letter, expressing the sympathy of this Association in his illness and a sincere wish for his recovery.

The motion was seconded by Dr. Hershheim and unanimously carried.

DR. EICHORN: I move that a telegram and letter be sent to Dr. Dalrymple, in Louisiana, who also is ill.

The motion was seconded by Dr. Baker, and unanimously carried.

PRESIDENT WELCH: Gentlemen, yesterday we passed over a report from the Committee on Revision of the Constitution and By-laws. Dr. McLeod, Chairman, will present the report.

Dr. McLeod read the report of the Committee.

REPORT OF COMMITTEE ON REVISION OF CONSTITUTION AND BY-LAWS

Your committee, to whom was referred the revised constitution and by-laws, as submitted by a former special committee, and adopted at the St. Louis meeting in 1922, respectfully reports that on call of Chairman John R.

Mohler, the first committee meeting was held August 31, 1922, at the Live Stock Exchange Building, East St. Louis.

In addition to the transaction of other routine business, it was moved and seconded that copies of the revised constitution and by-laws be forwarded to the President, Vice-Presidents, and to each member of the Executive Board. Motion carried, and committee adjourned.

<i>Committee</i>	{ J. R. MOHLER, Chairman C. A. CARY L. A. MERILLAT A. T. KINSLEY J. H. MCLEOD
------------------	---

During the interim following the St. Louis meeting, Dr. Mohler resigned; President Welch appointed Dr. McLeod as Chairman and Dr. Wm. Bell, of Nashville, Tenn., to fill the vacancy on the committee.

The second meeting of this Special Committee was held in the La Salle Hotel, Chicago, on the 5th day of December, 1922, all members present except Dr. Merillat. Meeting called to order by the Chairman, and Dr. A. T. Kinsley was chosen Secretary.

At 2:30 p. m. the first joint session with the Executive Board was called to order, Chairman Way presiding, the second joint session being held December 6, at 5:30 p. m.

The results of the above joint sessions of the Executive Committee and the Revision Committee were published in the March issue of our official JOURNAL. We recommend that the proposed revision be discussed, and, if satisfactory, adopted.

(Signed)	J. H. MCLEOD C. A. CARY L. A. MERILLAT A. T. KINSLEY WM. M. BELL
----------	--

PRESIDENT WELCH: What shall be done with this report?
 A motion to adopt the same will be in order.

DR. CARY: I move the report be adopted.

The motion was seconded by Dr. Kinsley.

PRESIDENT WELCH: Moved and seconded that this report be adopted. Any remarks?

The motion was carried.

PRESIDENT WELCH: What is your further pleasure, gentlemen?

DR. GIBSON: I rise to a point of privilege, first to express my pleasure at the prospect that you are coming to Des Moines next year; then to mention two or three things that we have overlooked in connection with that meeting, which we hope will be the best meeting this Association has ever had. First, splendid hotel accommodations, and get this: Hotel prices are regulated by law in the State of Iowa, and cannot be jimmied up at the time of a convention. We will not be abused in any hotel in Iowa where you attend a convention. When the gavel falls at final adjournment of this Association's meeting in Des Moines next year, the gates of the great Iowa State Fair will swing open, and your badge or button will admit you there, and you will have the privilege and pleasure of seeing the

greatest exhibit of breeding live stock that is held anywhere on earth. That is another inducement to come.

Another thing: Back of our meeting will be the organized Bureau of Conventions of Des Moines, represented by Mr. George E. Hamilton, who is spending the week here to study this Association to know what they do and what they would like to do, and what they want to do, and they have everything arranged in Des Moines so you can do just these things.

Then we want the ladies. I am pleased to see the high percentage of ladies here at this meeting. We want a higher percentage of the ladies in Des Moines. We have in Des Moines a Women's Building that is one of the best in America. That will be at the services of the ladies, as well as all other conveniences.

I wanted to say something for Des Moines, but was pleased that it wasn't necessary. However, I say to you: Come, gentlemen, and everything will be ready. (Applause.)

PRESIDENT WELCH: Shall we proceed to the consideration of the revision of the Constitution and By-laws?

DR. McLEOD: I would like to move that the President-Elect appoint a new committee to take this matter up and go on with it, and report at the next meeting in Des Moines.

. . . The motion was seconded by Dr. Bell. . . .

DR. MERILLAT: I am not so sure I understand what we have done. Have we revised the Constitution or not?

PRESIDENT WELCH: We have not.

DR. MERILLAT: Then I second the motion.

DR. KINSLEY: I rise to a point of order.

Will the adopting of this revision report carry with it the revision that appeared in the March issue of the JOURNAL? Was that not adopted? If it was, why have we not revised the Constitution?

DR. MERILLAT: I move that report be re-read.

. . . The motion was seconded by Dr. Cary, and carried . . .

. . . The report was re-read . . .

DR. KINSLEY: I rise to a question of information. Was this not adopted?

PRESIDENT WELCH: It was adopted.

DR. KINSLEY: Does not that adopt this revision of the Constitution that was published in the JOURNAL?

PRESIDENT WELCH: I think not.

DR. McLEOD: I think not.

SECRETARY HOSKINS: You have adopted a resolution or a recommendation to discuss the proposed revision, and if you think it satisfactory to adopt it.

DR. MERILLAT: Right now.

DR. KINSLEY: If it was adopted, it was not discussed. The motion was made and not discussed; therefore this is adopted.

PRESIDENT WELCH: We have adopted the report.

DR. KINSLEY: If you have adopted the report, you have accepted it, and that carries with it this revision.

DR. MERILLAT: If the members who are interested in this reorganization would trouble to read the October issue of the JOURNAL of the Association, they will find there is a paragraph therein which expresses explicitly that this shall be a notice to this Association that a certain revision of the Constitution, presented at St. Louis, will be voted on at this meeting, which is this moment, and it has been done, so the revision of the Constitution as laid down by the Executive Board in Chicago is in operation today, and it should prevail right now.

PRESIDENT WELCH: You have asked that we discuss the revision of the Constitution as published in the March issue of the JOURNAL, and, if satisfactory, adopt the same. My ruling would be that you have adopted the report, and placed the matter in proper shape for a discussion of the revision of the Constitution.

DR. HIGGINS: Does that report say, adopt the Constitution?

DR. CARY: Mr. President, when I made a motion to adopt that, that brought this before this Association to discuss. It should have been opened for discussion. There was no discussion asked for. Does that say the adoption doesn't carry with it the adoption of that report in full as printed, and everything?

SECRETARY HOSKINS: I wish to speak simply as a plain, ordinary member of the Association. I voted in the affirmative when the question was put for the adoption of this report. In so doing, I did not believe that I was voting to adopt any revisions of the Constitution. But I did believe that I was voting to accept this report, and that immediately following the adoption of this report the matter would be opened for discussion.

DR. MERILLAT: Mr. Chairman, I move a reconsideration of this problem.

. . . The motion was seconded by Dr. Udall, and carried . . .

DR. A. H. BAKER: I move the report be received, and then we can proceed to further business afterwards.

. . . The motion was seconded and carried . . .

DR. CARY: I move that the amendments, changes, revisions, be read and discussed for adoption.

What I call for is the report that was in the March issue.

SECRETARY HOSKINS: I believe it would be well to read the present clause in the constitution and the corresponding proposed revision. Does that meet with your approval? Do you want me to read the proposed revision, without knowing what you are revising?

. . . Secretary Hoskins read Section 1, Article V, as it is at present, and also the revision . . .

DR. CARY: I suggest he read all of this before we take it up seriatim, so we will understand the connection.

. . . Dr. Hoskins read the present sections, and also the revisions . . .

DR. UDALL: Mr. President, while it is true that this report concerning the revision of the Constitution and By-laws has been printed, and all of us have had ample opportunity for study and comparison, I think it is true that very few members of the Association, and very few members who are here, have a very clear knowledge of what all this implies. I am certain I do not, and I have listened carefully to what has been said.

We have an administrative organization that seems to be operating smoothly. I have not heard of any serious injustice that has resulted from our present administration. I believe that we should proceed slowly along the question of changing or revising the Constitution and By-laws. Our present administrative board is the result of years of experience. The machine has not been in use very long, and whether this proposed revision as read proposes to give us a new machine or change the wheels, or what not, I don't know, and I don't believe anybody else does.

I move, therefore, that this be reported to the Executive Board in order that they may give it their attention (they are the administrative office of this Association), and that it be subject to their disposal. If they see fit to report back to us, explaining what it means at the proper time, all right. That is the proposition, the motion that it be referred to the Executive Board.

DR. CARY: Mr. Chairman, this revision has been acted upon by the Executive Board in meeting with this Committee. It is required by the motion or resolution, whatever you call it, that established this Committee on Revision. They were present in Chicago when this was acted upon.

Now, you want to refer it back to them. What has been the experience in the revision of the Constitution and By-laws of this Association? I have been up against it. This is the third one I have had to do with, and if there ever was any Association that dilly-dallied along, it was the last one. There were six or eight different constitutions written out and some of them printed, that came before the Committee of which I was Chairman and which revised the Constitution and made the present one. Every year the story came up, just as Dr. Udall said a little while ago, nobody knew anything about it.

Now, I am not here to demand that this be passed; I am not here as a stickler for this or anything else, but there came up a demand for more recognition of the rank and file in this organization and especially on the Executive Board. They didn't call for just a double number of the Executive Committee; they called for a House of Delegates, with two members, at least, from each state that is represented in the American Veterinary Medical Association. When this Committee took this matter up, they found that was impossible, because some states have two veterinary medical associations and some states have none.

Now, in order to compromise this matter, in order to give these members of the Association, who are practitioners out in the field, who never attend our meetings, a say in this, we brought up the same thing as was brought up in the revision in Detroit, to give them a voice in the vote for the officers. It is in there. We kept it out at Detroit, because we didn't know what we could do.

There is a call for this from the rank and file. Last year we had four hundred members dropped; this year we got one hundred and seventy-five, some of them from Egypt. You heard about that yesterday. I don't care about that. The rank and file want more voice in the organization of this Association. I am one who wants to help, and I am going to do it.

I want to say to you, you can vote this down today; you can do a lot of things you want to, but in the end you will do this or something more, or you will let loose of the rank and file of this organization. This has nothing dangerous. I know

as much about the constitution and by-laws of this organization as any man, because I helped make it, and I will stand on this, that it won't hurt the Association and will get more men on the Executive Board, give the Association more voice than six or seven men who are elected, and won't dictate.

You say these complaints are unjust. I don't care whether they are just or unjust. They are here, and the rank and file are complaining about it. I never was a man in any organization who was afraid of the rank or file in that organization, or the people. Whenever an officer gets that way, it is dangerous. I have been an officer in my state for over thirty years.

Now, gentlemen, this has in it, as the Secretary knows, lots of things that will help him. It has some things in it that may scare you in a sense, in a way. Why, to increase the Executive Board seven more members, just doubling it, from the rank and file, from the vice-presidents, and give these vice-presidents something to do except carry the honorary membership of the Association—it gives them something to do, puts them on the Executive Board. The president has no power. His power has been shorn. I know; I have been through that. This is a sort of compromise of the extreme demand made by some of these men in the West and Central States, that a big organization like the American Veterinary Medical Association have a House of Delegates. If we adopted that system, we would have over a hundred on the Executive Board. We are not big enough for that. We haven't money enough, but we do have money enough for doubling this.

Now, I don't care; I have no axe to grind. I don't want anything at the hands of this Association, but for the good of the Association. This stands for it. It is a step in the right direction. It will stand correction in a few years.

Do you know wherein Great Britain stands much over the United States in many things? It has no constitution. Great Britain has what? An organization that whenever they want to live up to the times they have nothing staring them in the face like a fixed constitution. Our constitution stands up against us every once in a while, and we are prevented from doing what we want to do.

I am not criticizing. God knows, I owe all I have to the United States, but here we have to grow a little. We have an expansion in this. This is a thing along the right lines, and

somewhat along the lines that were asked for, but not so extreme.

There are some things that may not work out. We can correct them, just as we did in Detroit. What did they do the year following Detroit? They were changing the constitution and by-laws without submitting a written paper. I had to kick on it. Lots of it was good, and proved good for the organization. Now, we stand and ask for something that will make the machinery work better for the Secretary, for all concerned, and a lot of us say we don't want it because we don't understand it.

How is the legislature taken care of at Washington? Is it done on the floor? Who does it? Committees. Most of the bills acted on in the House of Representatives and Senate are acted upon by committees. We want to get a little more liberal. We want to trust our committees some more. We want to act more along the lines of getting progressive, acting along the lines of the good of the rank and file, of the majority.

Some one said, "You are giving them the right to vote; they won't vote."

That is true. I have seen men both North and South in the great United States that have lived for years and never voted in the great free republic of the United States. You can't make a man vote. You can't get a hundred per cent vote anywhere, unless you go out and drag them in. There is no criticism on them in that respect. Now, gentlemen, you can vote this down, you can hash it up and down as I have seen it done time and again. I want to promise you you will make no more progress than you are making now in the adoption of this thing as it stands. If you want to go farther two or three years later, go farther. Here is improvement. It gives representation, and it gives the rank and file a right to vote for the President. The election of President is a year in advance, and gets him ready for the office. I know about nine out of ten presidents elected here suddenly on this floor don't know what they are up against until they are ready to give the gavel over to some one else.

What does the American Medical Association do? They do that. Is this what you may call dangerous, radical legislation? It is not; it is for the good of this Association, and I hope we have the good wise judgment to adopt it as a step in the right direction.

DR. MERILLAT: I second Dr. Udall's motion.

DR. KINSLEY: I move this matter be laid on the table.

PRESIDENT WELCH: Moved and seconded that this report be referred back to the Executive Board. Any remarks?

DR. CARY: Mr. Chairman, I rise to a point of order. A motion to lay on the table takes precedence.

DR. KINSLEY: I move this matter be laid on the table.

DR. CARY: I second the motion.

PRESIDENT WELCH: Gentlemen, a motion to lay this matter on the table has been made and seconded. Those in favor signify by saying "aye;" opposed, "no." The motion is lost.

DR. MERILLAT: Now, gentlemen, you have heard Dr. Cary tell you about a remarkable system of running an association. It is the history of national associations in the United States that those who vote by postal card, by proxy, are destroyed and do not permanently exist, because it is the least democratic organization that ever was created, and is not representative as the letter of the provisions states. The Committee on Revision was appointed with the object of studying the possibility of making the American Veterinary Medical Association a delegate association. That was the spirit of the influence that created this committee, to make the American Veterinary Medical Association a federation of state associations.

It made a report at St. Louis with this as one of its recommendations, that the governing body of the American Veterinary Medical Association shall be constituted of delegates from the various state associations.

Now, gentlemen, I do not know, neither does Dr. Cary know, whether this is wise or unwise, but what I want the American Veterinary Medical Association to do is to give the members the privilege of studying whether or not this is feasible. I am firmly convinced that if the American Veterinary Medical Association elects its president by mail ballot, it will be less representative than it is today, for the reason that, as Dr. Cary has confessed, few people vote, and so many vote who are not acquainted with the issues, and do not, therefore, vote intelligently and do not express the wishes of the Association.

That is why I believe that this problem, which is a great problem, should be sent back to the Executive Board for discussion. I do not believe it would be wise for the American Veterinary Medical Association to make a revolutionary change in its constitution, but I do believe that it is one of our duties to study, during the next few years, the possibility and the advisability of this becoming a federation of all of the associations of

the United States. It is not necessary to do it now, not necessary to do it next year or the next, but let this be an open question before the American Veterinary Medical Association for some time to come, so when we do take the step, we will know it is wise. Let those who have had to do with the state associations analyze it and read it, and be ready to take it over.

So this radical revision which extends this abomination of a system of mail voting over all the officers, I do not think should prevail. In fact, since I have been a member of this Committee I have believed that all of the ills of this association, all of the trouble, if there is any (I believe he has magnified it), coming out of the rank and file, as we say, comes from the fact that we already elect six members of the Executive Board by postal card ballot; that if these same men who complain were able to come to a meeting and feel that they had a voice in the election of some of the executive officers of that body, they would be more inclined to come to a meeting. There would be an inducement to come to a meeting if they had some voice in its work. Now, you are going to close the membership.

Those who come to the meeting year after year, will have no voice in the affairs of the Association, except to nominate a President, and go home after a while, and then sign a postal card ballot.

Gentlemen, I believe the whole trouble is that the people who come to the meetings, come here and listen to papers; they feel they haven't any power. If you would change this proposition so that the five vice-presidents who are elected on the floor are actually members of the Board, the members would feel they have some little execution in the administrative affairs of the Association.

This thought prevailed in my mind ever since I have been a member of this Committee, but I am sorry to say I have been turned down at every turn on that belief.

It is my idea, instead of electing five figurehead vice-presidents, who have nothing to do except have their names on the programs, have those men come here and serve as members of the Executive Board. Then the whole membership would feel it is worth while to go to an Association meeting because they have something to say. If you deprive your members from having anything to say in the Association meetings, your attendance will get smaller. You may remember when we went miles and miles for no other purpose than to elect a secretary or president. Now, are you

going to take away the power we have at the meetings to elect these officers, and leave it to a postal card vote.

Here is something else to think of. A man might have an inclination to send around a postal card to his friends and get twenty or thirty votes. A man who is president of a veterinary society, a good salesman, may go around and say, "Vote for me," and he can get the necessary ten or fifteen votes to put him in.

Those out in the field, who are taking no particular interest in the affairs, don't vote at all. If they do vote, they don't know whom or what they are voting for. So I hope Dr. Udall's motion to refer this back to the Executive Board, so that we all can study this problem seriously with the hope of making some sane revision in the future, prevails.

DR. KINSLEY: I just want to express my views of why I don't want this to go back to the Executive Board, and why I want it to lay on the table.

Gentlemen, this Association has given me all I can ask for. I have nothing in mind except that if it is referred back to the Executive Board it dies. My idea in laying it on the table is that the Chairman of the Committee can bring in another report a year hence. If you refer it to the Executive Board, that is the end.

I am not appealing to you to adopt this, but I am appealing to you to kill this motion, and let us present another proposition for consideration here at the next annual meeting. Do not refer it to the Executive Board.

SECRETARY HOSKINS: I would like some information. I would like to know whether it would not be possible to do one thing with some of these recommendations and possibly something else with the rest of them.

DR. KINSLEY: You cannot.

DR. CARY: Yes, it would. This Association has power to adopt any one of those sections recommended and reject any.

SECRETARY HOSKINS: The reason I asked that question is because several of those proposed amendments are my particular pets, and I am interested in seeing them put on the books in the quickest manner possible.

DR. CARY: There isn't any question but what we can take up this proposition seriatim and adopt any section or part of it, and amend it.

DR. UDALL: I do not want to occupy the time of this meeting, and I don't want to pass any judgment on these proposed revi-

sions, but I would submit as evidence of the wisdom of returning it to our Executive Board, the confliction of opinion that has already arisen as to how we can handle it. We have duly selected an administrative body and an Executive Board, and purely as a business proposition, I submit that it is good policy and wisdom to find out what they think of it before we act on it.

This came from the floor. The idea that we can't get it back from the Executive Board is nonsense. If we can't get anything back from them, we had better abolish the Board. As long as we have a machine and administrative officers for doing such things, I would like to know what they think of it. The fact that they sat with the Committee and the Committee brought in a report doesn't mean we have any report from them.

DR. CARY: The Executive Board acted in passing this.

DR. UDALL: I am not questioning the merits or demerits of this revision. Perhaps they have approved it, but let them say so.

DR. MCLEOD: Some short time ago, most of the members present are aware, in St. Louis, a special committee was appointed to revise the constitution, so that the practitioner in the West could get the recognition he deserved, and this Association could be made a more democratic association. That committee took up this work.

The committee was composed of Dr. Merillat, Dr. Cotton and myself. We submitted a constitution at the St. Louis meeting. That constitution, after being submitted, was not read at the meeting, but it was intended that it be published in the JOURNAL so as to save time. That old constitution submitted by the old committee at St. Louis is there on the table, and I believe that constitution, that this Association spent money and time on, should be read before this Association. That old committee report is a good constitution, and it is built along the lines to create a more democratic organization.

I believe, before we adjourn, this whole report of the committee should be read, as the report called for at this meeting, so it can be considered at the following meeting in Des Moines.

DR. CARY: This constitution and by-laws was considered by both committees to a certain extent, and it was decided they couldn't report that, and it has no standing before this Association. It must come before this Association; it must be introduced as a new constitution and new amendments before the

Association, and lie over a year before it can be brought in before this committee.

The only thing that is considered before this body is the report of the combined committees, and that is all that can be considered under the constitution and by-laws.

DR. MERILLAT: Our original committee report contained one provision. It wasn't one which specifically recommended that the governing body of the American Veterinary Medical Association shall be constituted of delegates to the Association.

That was adopted unanimously. The second one was that a special committee be appointed to meet with the Executive Board with a view to studying the details, the verbiage, etc., that might be faulty, and we hereby said, "Submit this as a year's notice for revision of the constitution."

That was the sense of our committee report.

Now, words have juggled this, gentlemen; to be perfectly frank with you, I interpret this in this way: That when this special committee met with the Executive Board, they ignored the principles, not only the word but the principles, of the work of this committee constituted of Dr. McLeod, Dr. Cotton and myself, and introduced instead what you have heard the Secretary read, which has nothing whatever to do with the delegate system of representation.

Now, it never was our thought, when we made this recommendation, that this should be done immediately. We wanted more of the members of the American Veterinary Medical Association to study the delegate system with a view to taking it up in the future. Dr. Cary says it is the wisdom of that committee that it couldn't be done.

How in the devil do they know? They didn't try it. Other associations have succeeded under that system. I don't know whether it would be feasible, but I am willing to leave it to the judgment of the Association members. If it is bad, throw it away; if it is good, adopt it.

We say some states have two associations and some have none. If they have none, they don't deserve any representation; if they have two, it is up to the American Veterinary Medical Association to recognize the one that should be recognized.

The present constitution provides for a group of states to get together and provide for an adoption very gradually. It would take six years to adopt it. The existing officers of the Association would remain in office and only be replaced very

gradually, and while I don't say it is wise, gentlemen, I hold that the American Veterinary Medical Association has a right to study the delegate system of administration, with a view of either rejecting it or adopting it at some time in the future. Whether it is wise or unwise is to be decided upon.

Consequently, if we put this back to the Executive Board, together with the discussion that has taken place here about it, I am sure they would be willing to bring it back to us again and discuss it. Laying it on the table and taking it off is splitting hairs.

You say the Board is going to kill it. That condemnation of the Executive Board doesn't hold. I believe the Executive Board is constituted of fair-minded men who have the welfare of the Association at heart. We can depend upon them. They have been elected by postal card vote, and they are free from harm.

DR. CARY: I am not kicking on that committee.

DR. MERILLAT: They are a good committee. Let them study it and bring a report back at such time as may seem fit.

DR. CARY: Will the Secretary read the resolution that established this committee?

. . . Secretary Hoskins read the resolution . . .

SECRETARY HOSKINS: In this committee report the notice is given for the adoption one year hence, and this committee's findings, in conjunction with the Executive Board, will be published so that every member will have an opportunity of studying this prior to the next annual meeting, when it is up for adoption.

DR. CARY: I want the paragraphs read that started the motion that put this committee before this Association, at the top of Page 101.

. . . The Secretary read as directed . . .

DR. KINSLEY: Mr. President, I maintain that has been carried out to the letter, and because of the fact that Dr. Merillat was unfortunate in having a state meeting on, when this committee met in Chicago, I don't believe that is sufficient cause for his condemnation of what was done. We did the best we could under the circumstances in this conference. That is what is proposed, and it is a sort of equalization. I have been trying to reach the end that Dr. Merillat wants, by having this whole proposition resubmitted. He doesn't seem to be able to grasp that situation.

Now, by referring it to the Executive Board, and having it come back with the same recommendations or some modifications is not the one we wanted at St. Louis.

DR. STANGE: It is now going on seven o'clock, and it is apparent that this is going to be a big problem, and, inasmuch as there have been a number of meetings called for six-thirty and seven o'clock, I make a motion that we adjourn.

. . . The motion was seconded and carried . . .

DR. KINSLEY: A question of information. I should like to have a time set for this particular subject so we will know when it is coming up.

PRESIDENT WELCH: We will announce the time when it will be considered.

. . . The meeting adjourned at six-thirty . . .

ADJOURNMENT

(To be continued)

A HANDY GUIDE

Dr. Edward B. Carter, Director of the Biological Laboratories of Swan-Myers Company, Indianapolis, Ind., has prepared a very convenient little folder, giving a schematic arrangement of the first two orders of Schizomycetes according to the new classification given in Bergey's manual. Dr. Carter has indicated after the name of each Family, Tribe and Genus, the page where these will be found in Bergey.

The folder also contains a list of fifty pathogenic organisms, in which are given both the old as well as the new names. Copies of this chart can undoubtedly be obtained by communicating with Dr. Carter, who used it as the basis of a talk given before the Indianapolis Branch of the Society of American Bacteriologists on the night of November 16, 1923.

Recognizing the dog as the original and most reliable burglar alarm, a great insurance company has reduced the rates for residence burglary, theft and larceny insurance where a dog is kept.

OTHER MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. J. Elliott Crawford, in the Academy of Medicine, 17 W. 43rd St., on Wednesday evening, October 3, 1923, at 8:30 o'clock

The minutes of the June meeting were read and approved.

Dr. Geo. Watson Little read a paper on "Indications for Cecectomy in the Dog." Dr. Little must have spent a great deal of time and thought to prepare this paper so carefully. It was unusually interesting and valuable to the small animal practitioner. He has worked out an unusual and simple technique for performing this operation. He exhibited several specimens, and photographs of the dogs operated upon, both before and after the operation, showing a surprisingly good effect upon the physical condition of the animals.

Dr. E. B. Ackerman read a paper on "The Police Dog." This paper was quite original, and brought out discussions by a number of members present.

Dr. Geo. H. Berns read a paper on "The Veterinarian and the Status of the Veterinarian in New York and Brooklyn Fifty Years Ago." This indeed was an interesting paper, and showed plainly the progress the veterinarian has made, both socially and professionally. He also gave the history of the various veterinary colleges in the city and their struggles for existence during these years. This paper will be published, and surely will be enjoyed by all who read it.

On motion a vote of thanks was extended to the speakers for their contributions to the program.

The Secretary-Treasurer reported having sent check to the Building Fund of the New York Academy of Medicine for \$100.

No further business appearing, the meeting adjourned.

NOVEMBER MEETING

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the Pre-

sident, Dr. J. Elliott Crawford, in the Academy of Medicine, 17 W. 43rd St., at 8:30 p. m., on Wednesday Nov. 7, 1923.

Dr. Alex. Slawson spoke on a treatment for dumb rabies. He cited three cases in dogs that showed symptoms of dumb rabies, and after having received morphin and ether daily for three or four days, these dogs began to eat and apparently recovered. The first case was a chow that showed a dropping of the jaw and other symptoms, but recovered.

The second case, a bull having similar symptoms, recovered after receiving his treatment, but was chloroformed later, and on autopsy by the Health Department no Negri bodies were found in the brain and the regular animal inoculation failed. This case, Dr. Slawson believes, produced a self-immunity that destroyed the Negri bodies, if ever present in the brain.

The third case recovered also. Dr. Slawson believed that his treatment relieved the animal from pain and anxiety, thereby living long enough to produce a natural immunity. This report brought out a number of expressions of opinions on the subject.

Dr. Bruce Blair reported having seen several cases showing some symptoms of dumb rabies, but all started eating about the fourth day after having received high enemas. He did not believe these cases dumb rabies. Dr. O. R. Schueler was of the opinion that all cases of dumb rabies died.

Dr. W. Reid Blair spoke of these cases, and felt sure that when Negri bodies were found in the brain and animal inoculation was positive, we were dealing with a case of rabies, and when these tests were negative he thought we were dealing with some other disease and not rabies. Dr. Crawford, after having seen many cases of rabies, believed all cases died in from two to three days.

Dr. C. G. Rohrer reported having seen several hundred cases of rabies, but could not recall one case that did not die. He also believed one should not be too hasty in making a diagnosis or of mentioning rabies to the owner, thereby saving the owner a great deal of mental anguish. But, when satisfied that it is a case of rabies, notify the Department of Health and let the responsibility of returning the dog to the owner, to be allowed to run at large, rest on the Health Department.

Dr. R. W. Gannett believed that if at this time we have produced an anti-rabic treatment for the prevention of this disease, we might at some time produce a treatment for the disease, or the animal might itself produce a self-immunity

and recover. Drs. Ackerman, McKim, MacKellar and others joined in the discussion.

Dr. Robert S. MacKellar reported an odd accident. A horse in being backed out of his stall upset a steel fork, one of the prongs piercing a new rubber pad, entering the leg at the fetlock and coming out several inches above, only to re-enter the leg a few inches farther up. It required several hours of strenuous labor to cast the animal, and, while freeing the upper portion of the prong, it could not be removed, but finally, with the aid of a good blacksmith's hammer, it was driven down and out. The horse made a very good recovery.

Dr. C. S. Chase and Dr. MacKellar gave a very good report of the A. V. M. A. meeting at Montreal. They reported it one of the best meetings, both educationally and socially, held in some time. Dr. Gannett reported the proceedings of the New York State meeting as most instructive and interesting. Dr. W. Reid Blair read an account of the comparative blood-count in horses, in which it was reported that the running horse developed as high as a 52 per cent red cell count, due to the terrific muscular strain. Dr. Benj. D. Pierce, of Springfield, Mass., was present and reported several interesting cases. He also said that the running horse, doing from 6 furlongs to 1½ mile a race, would develop a 52 per cent blood-count. He would like to have a count made on a trotting horse, required to do from 5 to 10 miles daily.

Lt.-Col. Fraser, from Fort Joy, Governors Island, N. Y., was present and gave a short talk.

The discussion of a proposed amendment to the veterinary practice act brought out a number of opinions from the number present. It was regularly moved and seconded that the Secretary write Dr. Augustus Downing, Assistant Commissioner of Education, at Albany, that it is the expression of this Association that any amendment he might propose that would tend to elevate the veterinary profession would be endorsed by the Association.

The resignations of Drs. Victor Carabba and William Sheppard as members of the Association were accepted with regrets. Dr. Durner reported the illness of Dr. John J. Foy a member of the Association. The Secretary was instructed to write a letter of sympathy to Dr. Foy.

Dr. W. Reid Blair reported having had his attention called by Dr. F. H. Miller, a short time ago, to a very unusual case

in a dog. The doctors were of the opinion that possibly they were dealing with a new disease. Dr. C. G. Rohrer reported having seen a number of cases, showing mixed typical and atypical rabies symptoms, that recovered. He mentioned that Dr. W. Byron Coakley, of New York, who has done a great deal of research during the past eighteen years, in diseases of the dog and cat, had found a new disease in the dog, cat, monkey, guinea pig, rabbit and other animals in 1906.

One type of this disease in the dog resembles closely the furious type of rabies. Another type resembles dumb rabies. There were types resembling, respectively, the pulmonary, nervous and intestinal types of distemper and hepatogenous jaundice. The retinas, the various muscle groups, all of the nerve centers, as well as the mentality, were affected in other cases. All of the cases showed mixed typical and atypical rabies symptoms, one case showing all of the typical symptoms usually found in a case of dumb rabies, and two cases, exhibiting three typical symptoms of furious rabies, recovered without treatment. Typical and atypical Negri bodies were found at autopsy in most of the cases. The morbidity and mortality were as great among the older animals as among the young. Because of the lack of proper terminology, he and others had been calling the ailment "Coakley's Disease."

On motion a vote of thanks was extended the speakers of the evening.

No further business appearing, the meeting adjourned.

C. G. ROHRER, *Secretary*.

NORTH CENTRAL IOWA VETERINARY ASSOCIATION

The fall meeting of the North Central Iowa Veterinary Association was held at Fort Dodge, Iowa, November 8, 1923. The meeting was called to order by President C. W. Anderson, of Jewell, who, in a short address, stressed the need for attendance at the Association meetings and the need for proper organization of the profession.

Papers were given by Dr. J. H. McLeod, of Charles City, on "Recent Legislation Affecting the Profession," and by Dr. E. R. Steel, of Grundy Center, on "Some Matters of Interest to the Profession." These two papers were discussed by Drs. Treman, of Sac City, and Moye, of Manson, and by the membership generally.

We were particularly fortunate in having with us Sir Arnold Theiler, Director of Veterinary Education and Research for the Union of South Africa. Sir Arnold gave a most interesting address, reviewing the history of his country and the work that he has undertaken. Among other interesting statements was one that encouragement for veterinary work in the Union of South Africa has been received from the United States. He mentioned particularly the work done on Texas fever, and that this work has served as an impetus for work done in South Africa with diseases which are transmitted by ticks and other insects.

Dr. C. H. Stange, Dean of the Veterinary Department at Iowa State College and President of the American Veterinary Medical Association, addressed the meeting on "Future Activities of the Profession."

Dr. G. E. Golden, B. A. I., Sioux City, Iowa, gave a paper on "The Eradication of Tuberculosis."

The meeting was then adjourned, and in the evening a dinner and dance was given by the Fort Dodge Serum Company.

H. J. SHORE, *Secretary*.

NEVADA STATE VETERINARY ASSOCIATION

The 1923 annual meeting of the Nevada State Veterinary Association was held at Reno, November 9, 1923, having been postponed from January of the same year

The forenoon was devoted to a demonstration of clinical cases of bovine lymphangitis at a local dairy, by Dr. N. E. Nielsen. Approximately twenty cows affected with the disease in various stages were presented for the members' consideration.

After a recess for luncheon, the members gathered in the Agricultural Building of the University of Nevada for a combined literary and business session.

The subject of bovine lymphangitis with special reference to its importance as a complicating factor in tuberculin testing was presented by Dr. N. E. Nielsen. Dr. Jacob Traum, of the University of California, gave a most interesting and comprehensive talk covering his work on bovine lymphangitis since the condition was originally reported by him in 1916. Dr. Traum dwelt more especially on the pathological and bacteriological aspects of the disease. The discussion on these two talks

was led by Dr. L. C. Butterfield, supplemented with remarks by Dr. R. A. Given and Dr. Stanley Worley.

At a short business session Dr. R. A. Given and Dr. Stanley Worley were elected to membership in the Association.

Dr. W. H. Hilts, of Elko, was elected President of the Association, Dr. N. E. Nielsen, of Reno, Vice-President, and Dr. Edward Records, of Reno, Secretary-Treasurer.

The Association dinner was held at the Hotel Golden, twenty members of the Association and guests participating. After dinner, the Association reconvened in the Agricultural Building, where brief but valuable and interesting reports were presented as follows: "Tetanus in Sheep," Dr. Robert Dill; "Results of Bovine Abortion Vaccination," Dr. W. B. Earl; "Equine Abortion," Dr. G. E. Bamberger; "Braxy in Sheep," Dr. L. R. Vawter; "Red Water Disease in Cattle," Dr. F. H. Baker; "Tularemia," Dr. W. H. Hilts.

The presenting of these reports together with the discussion upon them provided what everyone considered a well-spent evening.

EDWARD RECORDS, *Secretary*.

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION

The fourteenth semi-annual meeting of the Central New York Veterinary Medical Association was held at Syracuse, New York, November 20, 1923. The meeting opened with a clinic at the infirmary of Dr. J. A. Pendergast, and included the following cases:

Case 1—Gray Gelding—Quittor.

Surgeons—Drs. Long and Danforth.

Case 2—Brown Gelding—Ulcerated tooth—Trephined and punched out.

Surgeons—Drs. Danforth and Pendergast.

Case 3—Bay Gelding—Poll evil.

Surgeons—Drs. Stack and Long.

Case 4—Fox terrier—Enlarged mammary gland—Removed by the knife.

Surgeon—Dr. F. E. McClelland.

While not having as many cases as at some of our former clinics, it was most interesting and instructive. During the course of the clinic a lunch was served, as is our usual custom.

At two o'clock we adjourned to the St. Cloud Hotel, where the regular business session was called to order at 2:45 p.m., with President Danforth in the chair. Roll-call showed the following members present: Drs. D. A. Boardman, J. K. Bosshart, F. N. Burke, W. L. Clark, A. L. Danforth, E. E. Dooling, W. G. Hollingworth, J. B. Knapp, W. M. Long, H. D. Laird, Frank Morrow, J. A. Pendergast, W. M. Pendergast, J. C. Stevens, J. H. Stack, W. M. Sullivan, W. B. Switzer, A. J. Tuxill, Joseph Turner, H. J. Milks and Prof. V. A. Moore.

Dr. Joseph Turner was regularly elected as an associate member.

A vote was taken upon the proposition of changing the by-laws to give the Association power to change the place of the annual meeting to a place other than Syracuse, upon a majority vote of the members present at the preceding semi-annual meeting, which was duly carried. Subsequently a motion to rescind this action was unanimously carried, and a committee was appointed to draw up a new resolution in regard thereto. Drs. Tuxill, Pendergast and Clark were duly appointed as such committee, and they presented the following resolution:

RESOLVED: That our by-laws be so amended that this society have the power to change the place of any of its meetings to some other place than Syracuse by a majority vote of the members present at any preceding meeting.

After discussion, a motion was made, seconded and carried to lay the matter on the table indefinitely.

The meeting then opened under the head of "Papers." The first speaker was Dr. D. H. Udall, of the New York State Veterinary College, who gave a very instructive talk on skin diseases. A good discussion followed, and Dr. Udall supplemented his address by answering questions upon the subject.

Next followed Dean V. A. Moore, who took for his subject: "Veterinary Education and the Future of the Profession." He presented vital facts which confront the regular practitioner of today. Following Dean Moore's address the following resolution was adopted unanimously:

RESOLVED: That the Central New York Veterinary Medical Association wishes to go on record as being opposed to the appointment of County Veterinarians, and to the making of any other appointments by the State or Federal authorities which in any way infringe upon the practice of local veterinarians who are graduates of recognized veterinary colleges and who have complied with all State laws relating to the general practice of veterinary medicine and surgery, and who are duly registered and entitled to practice the same.

The Secretary was instructed to send a copy of the foregoing resolution to both veterinary journals.

Dr. F. E. McClelland, of Buffalo, was the final speaker and gave a very interesting and instructive talk on "Small Animal Practice." He is exceptionally well posted on that branch of practice, and made many suggestions that will be of practical use to all who were privileged to hear him.

This concluded one of the best meetings yet held by this Association.

W. B. SWITZER, *Secretary.*

SOUTHWESTERN MICHIGAN VETERINARY MEDICAL ASSOCIATION

Sixty veterinarians gathered together in Kalamazoo, Mich., November 21, 1923, and organized the Southwestern Michigan Veterinary Medical Association. The meeting was called to order by Dr. B. J. Killham, State Veterinarian, who spoke upon the advisability of having an organization of the veterinarians in that part of the State.

A motion prevailed to form an Association, and the following officers were elected: President, Dr. F. E. Stiles, Battle Creek; Vice-President, Dr. J. A. Schaefer, Bangor; Secretary-Treasurer, Dr. George McCollister, Kalamazoo.

The literary program was opened by Dr. McCollister, who discussed the hog cholera situation in Southwestern Michigan. Recess was then taken for lunch, and the program resumed at 1 p.m. Dr. H. J. Stafseth, Poultry Pathologist, of the Michigan Agricultural College, spoke on some of the more important diseases of poultry encountered in Michigan. Dr. E. T. Hallman addressed the meeting in his usual interesting fashion on his particular hobby, "Sterility."

"Pitfalls in the Vaccination of Garbage-fed Hogs" was presented by Dr. J. M. Miller, of Benton Harbor. The care, management and nursing of sick dogs was covered in an interesting paper read by Dr. E. K. Sales, of the Michigan Agricultural College. Dr. S. R. Johnson, Pathologist of the Department of Agriculture, briefly discussed "Fright Disease in Dogs."

Everybody present felt that they had been well repaid for the time spent in going to and attending this meeting, with the result that it was decided to hold another meeting in March.

GEORGE MCCOLLISTER, *Secretary-Treasurer.*

UNITED STATES LIVE STOCK SANITARY ASSOCIATION

The twenty-seventh annual meeting of the United States Live Stock Sanitary Association convened at the La Salle Hotel, Chicago, December 5, 1923. A very attractive program, arranged by President Butler and Secretary Dyson, resulted in an unusually large attendance at all of the sessions.

Wednesday afternoon was devoted to the subject of hog cholera, and the following papers were presented: "Source of Infection in Primary Outbreaks of Hog Cholera," by Dr. I. K. Atherton, College Park, Md.; "Supplemental Studies of Post-Vaccination Troubles," by Dr. E. A. Cahill, Zionsville, Ind.; "State Sanitary Regulations for Hog Cholera Control," by Dr. H. A. Wilson, State Veterinarian, Columbia, Mo., followed by the report of the Committee on Hog Cholera Control, by Dr. C. H. Stange, Chairman.

Then followed two very interesting papers dealing with the subject of nutrition: "Nutritional Diseases of Cattle and Swine," by Dr. H. C. H. Kernkamp, of the University of Minnesota, and "Nutritional Diseases of Poultry," by Dr. J. R. Beach, of the University of California. Dr. A. F. Schalk presented the report of the Committee on Nutritional Diseases.

The entire session Thursday morning was devoted to tick eradication, three papers being presented on this subject: "Application of the Zone Plan in Systematic Tick Eradication," by Dr. William Moore, State Veterinarian, Raleigh, N. C.; "Is It Advisable to Undertake Tick Eradication Without Available Funds?" by Dr. J. H. Bux, State Veterinarian, Little Rock, Ark.; and "A Review of the Year's Work in Tick Eradication," by Dr. R. A. Ramsey, Washington, D. C.

Thursday afternoon the session was devoted entirely to bovine infectious abortion, and the following papers were presented: "Breeding Efficiency of Pure Bred Dairy and Beef Cattle," by Dr. W. L. Boyd, of the University of Minnesota; "The Experimental Production of Bang Abortion Disease," illustrated with lantern slides, by Drs. R. R. Birch and H. L. Gilman, of the New York State Veterinary College, Ithaca, N. Y.; and "Regulatory Measures in the Control of Abortion in Cattle," by Dr. J. W. Connaway, of the University of Missouri. These papers were followed by the report of the Committee on Abortion, by Dr. C. P. Fitch.

The session Friday morning was the largest attended session of the meeting. The following phases of tuberculosis were presented: "Present Status of Cooperative Tuberculosis Eradication Work," illustrated by a number of very graphic charts, by Dr. J. A. Kiernan, of the U. S. Bureau of Animal Industry, Washington, D. C.; "The Inter-Relation of Human and Bovine Tuberculosis," by Dr. M. P. Ravenel, of the University of Missouri; "Suggestions for Private Practitioners Conducting Tuberculin Tests Under the Accredited-Herd Plan," by Dr. C. H. Case, Akron, Ohio; "Agencies Through which Bovine Tuberculosis is Disseminated," by Dr. E. C. Schroeder, U. S. Bureau of Animal Industry. "The Relation of Indemnity to the Control of Tuberculosis" was discussed by the following: Dr. A. E. Zimmer, Columbus, Ohio; Dr. C. E. Cotton, St. Paul, Minn.; Dr. W. B. Lincoln, Nashville, Tenn.; Dr. W. F. Crewe, Bismarek, N. D.; Dr. T. E. Munce, Harrisburg, Pa.; and Dr. P. Malcolm, Des Moines, Ia.

At the Friday afternoon session Mr. Everett C. Brown, President of the National Live Stock Exchange, Union Stock Yards, Chicago, Ill., who was unable to be present at the morning session, presented the subject of salvage for reactors from the standpoint of the packer and owner. The speaker explained very clearly the reason why reactors were bringing cattle owners such disappointing salvage returns. In short, the market was glutted, the result of so many reactors being sent to Chicago for slaughter. The question is receiving serious study with a view to equalizing the marketing of reactors and preventing the present conditions which forced this class of cattle down to \$2.90 recently.

The report of the Tuberculosis Committee was received with a great deal of interest. This Committee had been in session during practically the entire time of the meeting, listening to grievances and receiving suggestions for modifications of the uniform accredited herd plan. Practitioners from many states waited upon the Committee, asking for elimination of the present discrimination between private and official veterinarians, especially in the matter of federal indemnity.

The following portion of the Committee's report will be of interest in this connection:

"All available information points to the fact that the work on the control and eradication of bovine tuberculosis can be further advanced by permitting accredited veterinarians to retest accredited herds as provided in section 6, paragraph A, of the uniform accredited plan.

A general compliance with this provision is therefore recommended.

"It is urged that this Association recommend to the U. S. Secretary of Agriculture that when 15 per cent of the total Federal indemnity allotted to be paid for tuberculous cattle, tuberculin tested by accredited veterinarians, is not sufficient to meet the demands in a given state, that an additional amount of the state allotment shall be used, provided sufficient funds are available.

"If this recommendation is accepted by the U. S. Department of Agriculture, section 6, paragraph F, of the uniform accredited plan shall then be changed to read as follows:

"Upon written instructions from the proper state official, accredited veterinarians may conduct tuberculin tests at the owner's expense on herds in the process of accreditation in states which approve of this method of testing, until all animals in the herd have passed one negative test; provided, however, that in such herds Federal indemnity shall be payable only in accordance with the regulations of the U. S. Department of Agriculture, which further provide that when 15 per cent of the total Federal indemnity allotted to each state is not sufficient to meet the demands in a given state, for cattle which may react to tests conducted under this plan by accredited veterinarians, then an additional amount of the State allotment shall be used, provided sufficient funds remain available."

In effect, if this recommendation is approved by the Secretary of Agriculture, and in turn accepted by the individual states, the present limit of 15% of the federal indemnity (amounting to \$300,000) allotted for the payment of indemnity for tuberculous cattle disclosed by tests made by accredited veterinarians, will be removed.

One of the resolutions adopted by the Association is an indication of the present trend of opinion regarding farmer vaccination, legislation and veterinary education. It is as follows:

WHEREAS, the promiscuous distribution and use of biological products containing living organisms or viruses is dangerous and a menace to the live stock industry of the country, and

WHEREAS, much money is being appropriated and expended in an effort to prevent, control and eradicate transmissible diseases of live stock, particularly some of the diseases in which these living viruses are being used, and

WHEREAS, a number of our states are expending considerable money for the training of men in the diagnosis, prevention and control of transmissible animal diseases, and

WHEREAS, the present low enrollment of students in these colleges is believed to be the result, in part, of legislation adverse to the practicing veterinarian, and

WHEREAS, the present rate of graduating trained veterinarians, unless increased, will not insure the live stock industry of this country the necessary veterinary protection, be it

RESOLVED, that this Association go on record as opposed to the use of biologics by laymen, and to the enactment of any legislation that will legalize the use of such biological products by any persons not trained in the diseases of animals.

The election of officers resulted as follows: President, Dr. J. G. Ferneyhough, Richmond, Va.; First Vice-President, Dr. J. H. McNeil, Trenton, N. J.; Second Vice-President, Dr.

J. H. Bux, Little Rock, Ark.; Third Vice-President, Dr. Benj. D. Pierce, Springfield, Mass.; Fourth Vice-President, Dr. P. E. Quinn, Harrisburg, Pa.; Fifth Vice-President, Mr. A. J. Glover, Fort Atkinson, Wis.; Secretary-Treasurer, Dr. O. E. Dyson, Kansas City, Mo.

CENTRAL MICHIGAN VETERINARY MEDICAL SOCIETY

After an interval of over one year, during which no meetings were held, the Central Michigan Veterinary Medical Society met in Jackson, Michigan, Wednesday, December 12, 1923, and participated in a splendidly arranged program.

Dr. E. T. Hallman, of East Lansing, opened the program by addressing the meeting on the subject of "Sterility in Cattle." Dr. Hallman did not attempt to cover the entire subject, but discussed only a few of the more important phases of the subject. A very interesting discussion on the handling of cervicitis followed.

"Poultry Diseases" was the subject selected by Dr. H. J. Stafseth, Poultry Pathologist, of the Michigan Agricultural College. Dr. Stafseth related numerous instances where veterinarians had materially increased their income by paying more attention to poultry diseases.

Owing to the fact that a number of smaller cities and towns in Michigan have been seriously considering the advisability of municipal meat and milk inspection, different phases of this subject were presented by Dr. R. A. Runnells, of the Michigan Agricultural College, and Dr. H. H. Sparhawk, Chief Veterinarian, Detroit Department of Health. Their remarks brought out a splendid discussion.

Dr. E. K. Sales, of Michigan Agricultural College, presented a paper entitled, "The Care, Management and Nursing of Sick Dogs." Dr. Sales paid particular attention to hygiene and dietetics in connection with the successful handling of canine diseases.

Dr. L. A. Wileden, of Mason, and Dr. A. B. Curtice, of Hillsdale, presented the subject of bovine tuberculosis. Dr. Wileden very frankly presented exact figures showing the effect of the recent tuberculosis eradication activities, both State and Federal, upon his income from tuberculin testing. In spite of the present adverse conditions, Dr. Wileden appeared to be rather hopeful

for the future. Dr. Curtice, who is located in a county designated as modified accredited area, brought out an interesting point in connection with tuberculosis work in such a county. He pointed out that it would be possible, under present conditions and regulations, for certain animals to reach the age of three and one-half years without being tested or tagged for identification, and such animals be allowed to leave the county without any restrictions or any provisions for keeping track of such animals.

Dr. Ward Giltner, Dean of the Veterinary Division of the Michigan Agricultural College, spoke on veterinary education. He briefly reviewed the history of the Veterinary College at East Lansing, and recalled that it had been established upon the urgent solicitation of the practicing veterinarians of the State. Dr. Giltner sounded a note of warning to the effect that there was every indication of there being a shortage of trained veterinarians at some time in the future, unless there was some increase in the enrollment of students in our veterinary colleges. He did not know just when this shortage would come, but felt that the present situation amounted to a survival of the fittest, in which a number of men, who had come to a realization that they were not properly equipped to cope with present conditions, were leaving the profession to enter other fields.

Dr. Giltner's talk was followed by a very vigorous discussion led by Dr. C. C. Mix, of Battle Creek, who very strongly maintained that the present low enrollment in our colleges was the direct result of the profession not offering the financial inducements enjoyed by those who were following certain other professions or commercial pursuits.

The meeting then adjourned to the dining room of the Otsego Hotel, where a splendid banquet was served, followed by two after-dinner talks. The first was by Dr. B. J. Killham, State Veterinarian, who chose for his topic, "Practical Farm Sanitation." Dr. Killham briefly reviewed the fundamentals of sanitation, and gave many excellent suggestions for applying sensible sanitation in farm conditions. He related what had been accomplished in the control of round-worm infestation in hogs, by the so-called McClean County system of farm sanitation. Dr. Killham also called attention to the fact that thousands of dollars were expended every year for disinfectants, which were not used intelligently and, therefore, with very little good results, only to give the user a false sense of security.

The other speaker was Dr. H. Preston Hoskins, Secretary of

the American Veterinary Medical Association, who brought greetings from the national association. He directed attention to the fact that the proposed policy for the A. V. M. A. had been published in the December issue of the JOURNAL, and asked every member to read it and study it diligently. Dr. Hoskins discussed the paragraphs entitled "Regulatory Service" and "Veterinary Biologics," because these two sections in the proposed policy appeared to have attracted the most attention. The intent of each of these two sections was clearly explained by him.

Dr. Hoskins also briefly reported upon several features of the recent meeting of the United States Live Stock Sanitary Association, quoting portions of the report of the Tuberculosis Committee, recommending the elimination of all discrimination between different classes of veterinarians. He also read the resolution adopted, deploring the enactment of any legislation that would legalize the use of biological products by any others than competent veterinarians.

W. N. ARMSTRONG, *Secretary-Treasurer.*

WESTERN NEW YORK VETERINARY MEDICAL ASSOCIATION

The Western New York Veterinary Medical Association held its tenth annual meeting on Friday, December 14th, 1923, at Buffalo, N. Y.

The meeting opened at 2:00 p. m. with clinics, where cases for observation, diagnosis and operation were considered. This was followed by a business meeting, with thirty-five members present. Routine business was transacted and resolutions passed on the death of Dr. Horatio S. Wende, late of Tonawanda, N. Y., and a charter member of the Association. The Committee on Rates and Charges submitted a report, and the matter was discussed. The Secretary was requested to send each member a copy of said report, for his consideration, to be returned with comments to the Secretary, who in turn would bring them to the Committee for a final decision.

At the close of the business session, dinner was served at the Palais Royal.

A literary program followed, at 8 p. m. Dr. W. J. Lentz, Director of Small Animal Clinics at the University of Pennsylvania, gave an address on canine distemper or influenza,

taking up the various stages and phases of the disease in a concise and able manner. Dr. F. E. McClelland, of Buffalo, N. Y., read a paper on "Some Unusual Cases We Meet in Small Animal Practice," which was highly interesting and instructive.

The ladies were very adequately entertained during the afternoon by Mrs. E. L. Volgenau, the hostess for the occasion. They joined the gentlemen at dinner, after which a party at one of the local theatres was enjoyed.

The following officers were elected for the ensuing year: President, Dr. Chas. D. Blaser, of Buffalo, N. Y.; Vice-President, Dr. F. F. Koenig, of Jamestown, N. Y.; Secretary-Treasurer, Dr. F. F. Fehr, of Buffalo, N. Y. Two directors, Dr. E. C. Cleveland, of Cattaraugus, and Dr. F. E. McClelland, of Buffalo, were elected for a term of three years, succeeding Drs. N. P. Hinckley, of Buffalo, and J. L. Wilder, of Akron, whose terms expired.

The Association will hold its next semi-annual meeting the second week in July, 1924, at Akron, N. Y., guests of Dr. J. L. Wilder.

F. F. FEHR, *Secretary-Treasurer.*

THE PIT-MOR-IAN

Number one of Volume one of the The Pit-Mor-ian has made its appearance. The publication contains "friendly chats on matters pharmaceutical and biological" and will be "issued occasionally" by Pitman-Moore Company, for circulation among their "friends of the veterinary profession." The initial number contains a variety of short talks on some of the P-M leaders. Every veterinarian should be on the mailing list to receive this publication.

FULLY DESERVED

The Sunday Magazine Supplement of *The New Orleans Item*, for December 9, 1923, contained a colored, two-page spread entitled "Dr. Dalrymple Loses Thousands to Save State Millions." Accompanying the article are three interesting photographs, showing Dr. Dalrymple as a boy, as a young man, and as he is today. The author pays a splendid tribute to our "international authority on veterinary science," and relates some of the many personal sacrifices Dr. Dalrymple has made in behalf of the South in general and Louisiana in particular. The best part is that the author did not overdo it. It's all true.

COMMENCEMENTS

ST. JOSEPH VETERINARY COLLEGE

On November 7, the St. Joseph Veterinary College held commencement exercises and graduated the following: O. R. Baird, L. V. Cowton, C. H. Hartman, M. T. Lewis, James E. Kelly, E. H. Meyer, John T. Schwab, J. B. Sigrist, L. W. West, E. Dewey Wilder, A. E. Wilcox, and E. E. Yingling.

Last year these young men were juniors in this institution and by special arrangements with the Chief of the Bureau of Animal Industry, permission was obtained to continue college through the summer season and graduate them this fall. This arrangement was carried out and a splendid course of instruction given them. In fact, I do not think any class has ever been graduated from this college that had a stronger, better regulated course than this one and the young men going out at this time are certainly well equipped to enter the veterinary profession. They are a high class of young men and I predict for them success in every way.

Last April the college graduated the following: H. L. Bennett, L. C. Feichtinger, J. E. Burch, Jay Cottingham, E. R. Davis, E. R. Fisher, R. C. Grubb, W. E. Hoot, J. M. Holliday, F. G. Kelly, J. C. King, P. C. Lahs, W. R. Lawrence, C. T. Loy, Rease Mitchem, T. R. Morse, W. I. Nelson, A. N. Overbaugh, C. E. Schlotthauer, K. Sears, T. J. Sharpe, R. H. Slagle, N. D. Stanley, R. B. Station, F. E. Williams, J. H. Foley, A. C. Garrett, and J. L. Boyle.

Owing to the fact that no catalog was issued this year, their names have never been published. This, also, was an excellent class of young men, and they deserve the respect of the veterinarians of the country.

At a recent meeting of the Board of Directors of this college, it was voted not to hold a session this year, and committees were appointed to dispose of the real and personal property of the institution. In closing up the institution in this way, it preserves the good name that it has borne among the veterinarians and we trust that the men graduated from it in the last few years will soon be accorded the courtesies due them from all veterinary organizations in the country.

The Class of 1923 was matriculated under an agreement entered into between the Bureau of Animal Industry, the War Department and the American Veterinary Medical Association, but at the New Orleans meeting, late that fall, the A. V. M. A. demanded four years of high school as an entrance requirement. The following year the St. Joseph Veterinary College met the requirements of the Bureau of Animal Industry, but were never honored with recognition by the A. V. M. A.

It was the ambition of the writer to continue the college, however, until these men had an opportunity to graduate. Most of them graduated in April 1923. Two or three who had missed out from one cause or another and others who met the high school requirements and matriculated the next year, constituted the class that graduated on the 7th of November, 1923.

We hope to live to see the day that the A. V. M. A. will open its doors to these young men. They are worthy in every respect and were all matriculated, taught and graduated under the agreement that existed at the time of their matriculation.

R. C. MOORE, *Secretary*.

SHEEP PARTICULARLY SUBJECT TO PARASITES

Sheep probably suffer more from parasites than do any other kind of live stock, says the United States Department of Agriculture, in a publication just issued, entitled "Parasites and Parasitic Diseases of Sheep," by Dr. Maurice C. Hall, of the Bureau of Animal Industry. Most of our losses in sheep, mutton, and wool are from animal parasites, as sheep suffer comparatively little from bacterial diseases, it is said. Lambs and young animals are most susceptible to parasites and suffer most from them.

Pasture rotation, use of forage crops, feeding from racks or bare floors, draining or filling swamps, and restraint of wandering dogs are measures the Department recommends as being of value in parasite control. It points out emphatically that *permanent pastures perpetuate parasites*. Parasite eggs pass in the manure, usually. The disposal of the manure determines the fate of these eggs, whether they find the way back into the animals and hatch out or not.

Copies of the bulletin may be had without cost, as long as the supply lasts, by writing to the Department of Agriculture, Washington, D. C. Ask for Farmers' Bulletin 1330.

ARMY VETERINARY SERVICE

NEW APPOINTMENT AND PROMOTION POLICY FOR MEDICAL DEPARTMENT RESERVES

The War Department has issued a new regulation governing appointment and promotion in the medical section of the Officers' Reserve Corps. It has undoubtedly been the desire of the Department to give to the veterinary profession of America a more satisfactory basis for appointment and promotion in the new reserve, and one which is free from the objectionable features of former requirements of these two important features of the reserve organization.

Under these new regulations, promotion in the reserve is given on the impartial and incontrovertible basis of length of commission in the reserve. There are no ifs nor ands nor meticulous reference to past records. A man who serves five years in one grade and who is of normal development in his profession, is eligible for promotion to the next higher grade, provided he is physically qualified for commission. Professional examination is waived for promotion from the lowest grade to the highest grade with one notable exception—the reserve officer who passes from the grade of major to lieutenant-colonel must be tested to determine his fitness for the administrative responsibilities of a higher grade. This is manifestly done to save the Government, as well as the individual, from the injustice of incurring a responsibility for which the individual is not qualified or gifted. Even for this one examination, however, a distinct advance has been made, since the Surgeon-General has evidently differentiated between the character of service and responsibility which the citizen reservist will be called upon to perform. Thus this communication is divided into four broad types:

- 1 for administrators,
- 1 for sanitarians,
- 1 for supply men,
- 1 for professional group.

This last group includes consultants and chiefs of services and specialists in medicine and allied sciences.

It is manifestly the desire of the Surgeon-General of the Army to adapt the examination to the candidate's special field of endeavor, and by limiting the examination to one grade, to avoid the unnecessary examination of busy professional men.

The changes outlined have many advantages to the profession over prior rules, but none more acceptable than a clear, simple and fair rule of promotion which will apply equally and justly to all comers.

The appointment features of the new regulations are far superior to the former ones. Two groups are recognized. The first includes original appointees who are given appointment by virtue of their established professional standing. The second includes former service men and men who, while not in the military service in the World War, were engaged in essential public service analogous to military service and necessary to the function of the Government in the conduct of the war. There are many perplexing problems in adjusting the reappointment rank of the several classes in this latter group, but it is clear that the Department has labored seriously to arrive at a just standard.

The organization of the reserve is a national responsibility which must be shared equally by the citizen and professional soldier. The Veterinary Corps of the Army in time of great national emergency will include so great a majority of the active and distinguished members of the veterinary profession of America that the responsibilities of this department will become that of the veterinary profession of America.

The Medical Department of the Army now calls for the cooperation of the body of the civil profession, and manifests a laudable spirit in offering appointment and promotion in the reserve under the most favorable possible terms consistent with the organization of a dependable agency. The defence plans for this country in a major emergency call for 3,000 veterinary officers, while the present enrollment in the Reserve Corps is 730. The Army Medical Department now seeks to enroll and classify personnel to fill places in prospective medico-military units, so that in a future emergency past errors may be avoided. The Medical Department has placed the reserve on a most favorable footing for the profession. It rests with the profession to come forward and by joining hands to establish a medical reserve system which will afford a protection for the present and guidance for the coming generation.

Veterinarians who are interested in this subject, and who desire further information, should communicate with the Adjutant-General's Office, War Department, Washington, D. C., and refer to A.G.O.6212 O.R.C. (10-12-23) Res.

COMMUNICATIONS

FROM A MEMBER IN ST. KITTS

TO THE EDITOR:

I have the pleasure of yours of the 11th ult., and am exceedingly sorry that I was unable to reply ere this. I beg to acknowledge membership card for year beginning September 1. Many thanks for same. I am very sorry that I was unable to attend the Montreal meeting, but in consequence of the isolated position of these small places it is difficult to get any one to act. I would be only too glad if I could get the Government to pay a man while I am on leave, if I could get some one to act for me, as I have not seen the dear old U. S. or Canada for nearly twelve years. Some time, eh!

Well, I have been in this Government's service for seven years and no vacation yet. Pretty tough on a fellow, but I have a wife and two boys, six and four years respectively, to look after and I can't give up a sure thing. I enjoy myself riding the Government's thoroughbred English stallion that I managed to get them to import for improving the breed of light horses. His name is Sorghum by Buckwheat out of Kill Hill, tracing back to Bend Or on sire's side and Kilmarlin on dam's side. Kilmarlin, sire of Ogden, sire of The Finn, sire of Zuo, is one of the best three-year-olds in the U. S. this year. So you see he is not too bad.

He won three races as a two-year-old; carrying top weight 127 pounds at seven furlongs in one race. As a three-year-old he won one race, the Kestwen Plate at Lincoln, one mile and three furlongs. He was unplaced in the Chippenham Plate at Newmarket. He is very quiet. He is not a tall horse, 15.2 hands, but a very sturdy looking animal with powerful hind quarters. He is now six years old. His first crop of foals, about one dozen, were born this year. They all come like him in color markings—bay, with a blaze face. Riding him, when I get time, is the only amusement I get around here, except the universal cinema.

Enclosed \$2.00 for lapel emblem and one for my car. At last I have got a car. They are very good in their way, but an old horse does not give so much trouble. I have two ponies—one I have owned seven years, and he has never been sick a day yet. He has picked up nails which incapacitated him once for

fourteen days. He is always ready, slow and sure, no buttons to push, no horn to honk, etc. The other is a mare. She is very fast in harness and is now in foal for Sorghum.

Again thanking you and with kind regards, I remain,

Yours sincerely,

ERNEST F. JARDINE,

Gov't Veterinary Surgeon.

Basseterre, St. Kitts, B. W. I.

September 14, 1923.

IODINE FOR STOMACH WORMS IN SHEEP

TO THE EDITOR:

Preliminary experiments have shown that a weak solution of iodine is a safe and effective treatment in the killing of the stomach worms in sheep. Further experiments will be carried on.

G. H. LAMSON, JR.

A. F. SCHULTZ.

Storrs Agricultural Exp. Station,

Storrs, Conn., December 15, 1923.

DANGER AHEAD

TO THE EDITOR:

Under this heading the editorial in the December number calls attention to a possible lack of qualified veterinarians.

The collection of facts regarding the probable supply of veterinarians is important and valuable information, but the conclusion drawn, that the attempts to modify existing laws to allow non-graduates to practice is due to a lack of qualified veterinarians, does not correspond with our information.

Data furnished by about one hundred traveling salesmen covering most of the United States, indicates that established practitioners as a rule are not overworked; that localities where no qualified veterinary service is available are very few, and in these cases the opportunities for a veterinarian are so limited it is doubtful if one could make a satisfactory living.

Many requests are received from graduate veterinarians for information as to possible locations. If the editor knows of a locality that needs and can support a qualified veterinarian, the writer can furnish the names of graduates who are looking for locations.

While efforts to modify existing laws to permit unqualified men to practice are sometimes made under the cloak of need for veterinary service, every case that we know of can be traced to some selfish motive, generally a politician wants to make a place for a "quack" friend.

N. S. MAYO.

Chicago, Ill., Dec. 8, 1923.

(The editorial in the December JOURNAL made no claim that there is any shortage of veterinarians at the present time. As a matter of fact, there seem to be enough. However, it is practically unanimously agreed, by those who have given the matter serious, unselfish consideration, that the present reaction can go too far in the direction in which it now appears to be headed. There can be only one result—a shortage of properly trained veterinarians. This may not come for five years. It may not come for ten. But it will come.

It should not be forgotten that it now takes from four to six years to secure a veterinary education. A veterinarian can drop out of the profession in as many seconds. Records show that few come back. A shortage of veterinarians can not be turned into a surplus, or even made up, in a week, a month, or a year. Many things might happen to our live stock industry while we are replenishing the supply of veterinarians.

As for legislation, we are only too well aware of the fact that practically, without exception, attempts to tamper with our veterinary practice acts are prompted by "some selfish motive," as claimed by Dr. Mayo, but we have heard of very few instances where the plea was not made, in behalf of some quack who figured on being granted a license to practice, that "he is located in a territory where there are no veterinarians; he is needed by the live stock owners in his community, and we would like to see him registered, etc."

The plea—a shortage of veterinarians—is the one most frequently made, because it is the one that usually proves most effective. It is our duty to do everything to conserve the supply of qualified veterinarians and not allow conditions to become such that our laws will be relaxed because of an actually existing shortage of veterinarians.

So far as the future is concerned, while on the subject, we might quote from an editorial in the December issue of *The Veterinary Alumni Quarterly*, as follows: "Undoubtedly a shortage of veterinarians is imminent. It looks as if this were a good time for young men of the proper type to consider entering the profession."—EDITOR.)

FOR PROLAPSED VAGINA IN COW

At the International Live Stock Exposition in Chicago, a pure bred cow was noted that had a small bullring placed through both lips of the vulva, to prevent a prolapse of the vagina. The owner stated that it gave very satisfactory results, and that sometimes two bullrings were used.

This seems to be a very practical and simple method of dealing with this problem. We have never noted the use of this instrument for this purpose before.

N. S. M.

MISCELLANEOUS

SIR ARNOLD THEILER KEPT BUSY

Sir Arnold Theiler has been kept rather busy delivering addresses in various parts of the country since the Montreal meeting. Some of the engagements which he has filled include the following: An address on "The Animal Diseases of South Africa," before the staff of the Biological Laboratory, Health of Animals Branch, Ottawa, Canada; "Diseases in Animals Caused by Toxic Plants," before the Ontario Veterinary Association, in Toronto; "Parasitic Diseases of South Africa," before the Helminthological Society, Washington, D. C.; "The Tropical Diseases of Africa," before the Pennsylvania State Veterinary Medical Association, in Wilkes-Barre, Pa.; "Phosphorus Deficiency in Cattle," delivered before an assembly of veterinarians in Philadelphia, Pa.; "The Protozoan Diseases of Dairy Cattle," before the World's Dairy Congress, in Syracuse, N. Y.; "The Tropical Diseases of Africa," before the faculty and students of the New York State Veterinary College, Ithaca, N. Y.

Three lectures were delivered at Harvard University Medical School, Boston, Mass., as follows: "Phosphorus Deficiency in Animals," "The Tropical Diseases of Africa," and "Diseases in Animals Caused by Toxic Plants." "Phosphorus Deficiency in Animals," was delivered at Rutgers Agricultural College, New Brunswick, N. J.; "Toxic Plants and Deficient Pasture as Causes of Animal Diseases in South Africa," at the Rockefeller Institute, New York City; "Animal Diseases of Warm Countries; Their Etiology and Prevention," Johns Hopkins University Medical School, Baltimore, Md.; "The Animal Plagues of South Africa," before the veterinary faculty and students of Ohio State University, Columbus, Ohio; "Phosphorus Deficiency in Animals," under the auspices of the Illinois Chapter of Sigma Xi, University of Illinois; "Phosphorus Deficiency in Animals," before seminar of Professor L. B. Mendell, Yale University, New Haven, Conn.

Sir Arnold addressed the North Central Iowa Veterinary Association, at Fort Dodge, on November 8, and was also scheduled for an address at the Iowa State College, Ames, Iowa, and one at the A. & M. College, College Station, Texas. He expected to sail from this country on November 22nd, *via* San Francisco.

NECROLOGY

GEORGE W. DUNPHY

Dr. George W. Dunphy passed away at his home in East Lansing, Sunday evening, December 16, 1923, after a lingering illness dating back over two years, during which time he had been bedfast almost continuously. He was in his 74th year, having been born September 2, 1850, at Niagara Falls, N. Y.

He was a graduate of the Ontario Veterinary College in 1880, the honor student of his class. He started practicing at Jackson, Mich., in partnership with Dr. S. Brenton. He later located at Quincy, Mich., where he established a very lucrative practice. In 1897 he was appointed State Veterinarian by Governor Pingree, and served until 1901. For several years he practiced at Coldwater, Mich. In 1904 he entered the service of Parke, Davis and Company, at Detroit, as Chief Veterinarian. When the Company decided to move their biological stables to larger quarters and away from the city, Dr. Dunphy was transferred to Rochester, and helped to develop the beautiful tract of 800 acres now known as Parkedale Farm. He remained in this connection until October 15, 1913, when he resigned to become State Veterinarian of Michigan again, under a reorganized State Live Stock Sanitary Commission. It was during this term of office that foot and mouth disease appeared in Michigan for the second time, and Dr. Dunphy was very much in the lime-light in his efforts to eradicate the disease. In 1921, ill health compelled him to resign as State Veterinarian.

Dr. Dunphy was at all times a prominent figure at veterinary gatherings in Michigan. He was a member of the State Board of Veterinary Medical Examiners, and on two occasions served as President of the Michigan State Veterinary Medical Association, the latter term in 1915-1916, in which year the American Veterinary Medical Association met in Detroit as the guests of the profession in the Wolverine State. In 1922, he was made a life member of the State Association. He was an honorary member of practically all of the local veterinary associations in the State.

Always deeply interested in control work, Dr. Dunphy took an active part in the United States Live Stock Sanitary Association, and served on practically all of the important committees

of this organization. In 1919 he was elected to the presidency of the Association.

In the American Veterinary Medical Association, Dr. Dunphy was a very active member at all times. He joined in 1893, and served as Resident Secretary for Michigan from 1900 to 1904 and from 1906 to 1907. He was twice a member of the Resolutions Committee, 1900-01 and 1908-09. He served on the committee on Intelligence and Education, 1901-02, and as chairman of this committee in 1918-19. In 1904 he was elected a vice-president, and the following year served on the Executive Committee. He was chairman of the Association of Veterinary College Faculties and Examining Boards, 1907-08, and served as a member of the first Committee on Veterinary College Investigation (1912).

Dr. Dunphy typified the class of veterinarian that is so rapidly passing. He belonged distinctly to the "old school" of rugged, resourceful practitioners who had to fight their battles under the tremendous handicap of limited college training and without the improved armamentarium of the more modern veterinary graduate. Through his associations, Dr. Dunphy always kept abreast of the times, and was ever ready to discuss the newer developments of veterinary science at the many meetings which he liked so well to attend.

Dr. Dunphy loved horses, and was considered one of the most skillful horseman in Michigan in his younger days. He was highly successful as a practitioner. Few men who have held the position of state veterinarian have ever kept in closer touch with the profession than did Dr. Dunphy. He frequently made long trips over the State, investigating outbreaks of different diseases, under all sorts of conditions and in all kinds of weather. He was devoted to his work, whatever it happened to be. He was kind to a fault, ever ready and more than willing to help a friend. He was an indomitable fighter, whenever he set out to accomplish anything, as those who have ever opposed him will testify. As an intimate acquaintance once said: "He is a good man to have on your side, but a mighty bad man to have against you."

During the more than two years that he was bedfast, his mind remained as clear as a bell, and nothing delighted him more than to have his old friends drop in for a chat and to reminisce a bit. He had a very retentive memory. Few men

have been more familiar with the veterinary history of the country, for the past forty years, than Dr. Dunphy.

He is survived by four children, one daughter and three sons, one of whom is Captain Charles B. Dunphy (K. C. V. C. '16), now stationed at Fort Benning, Ga., and one brother, Dr. Thomas Dunphy, of Crosswell, Mich. Funeral services were held at East Lansing, December 19, and the interment was made at Quincy, his old home, the following day. Over forty veterinarians attended the services.

EDWARD M. SAIGEON

Dr. E. M. Saigeon, of Flint, Mich., died November 27, 1923, a victim of apoplexy. He was born in Coldwin Township, Erie County, New York, June 10, 1874. He entered the Ontario Veterinary College in 1895, and was graduated in 1899.

After having served for over two years as a veterinary surgeon in the Quartermaster Department of the U. S. Army in the Philippines, Dr. Saigeon returned to this country and located in Plainfield, Mich., in 1901, removing to Flint in 1904, where he practiced continuously until his death.

Dr. Saigeon was an Odd Fellow and a Modern Woodman. He was much admired and highly respected by his townsmen as a charitable and patriotic citizen, and he enjoyed the reputation of being a highly ethical practitioner at all times.

Dr. Saigeon married Miss Flora E. Smith in 1904. She survives him, with three daughters.

MORGAN BAXTER LAMB

Dr. Morgan B. Lamb died suddenly, October 4, 1923, at his home in Columbus, Ohio, at the age of 55 years. Dr. Lamb was graduated from Ohio State University in 1901. The same year he went to Washington State College, where he was an instructor in the College of Veterinary Science for one year. He then returned to Ohio to accept a position under Dr. Paul Fischer, then State Veterinarian. He was later made Assistant State Veterinarian.

During the World War, Dr. Lamb served as second lieutenant, and later as captain, in the Veterinary Corps. Dr. Lamb joined the A. V. M. A. in 1902. He was an honorary member of the Alpha Psi Fraternity. He is survived by his widow, a sister and a brother.

CURTIS LOZELLE FRY

Dr. Curtis L. Fry, of Denton, Texas, died at Kansas City, Mo., August 6, 1923. He was a graduate of Ohio State University, class of 1917. Immediately after graduation he entered the Veterinary Reserve Corps and was stationed at San Francisco. At the time of his death he held a commission as first lieutenant in the Veterinary Officers' Reserve Corps. He was a member of the Alpha Psi Fraternity.

HORATIO S. WENDE

Dr. H. S. Wendé, late of Tonawanda, N. Y., died July 28, 1923, at the Buffalo General Hospital, following an operation for gallstones. He had been ill but a short time.

Born in Millgrove, N. Y., February 4, 1864, Dr. Wendé received his early education in the public schools and his veterinary training at the Ontario Veterinary College, graduating with the class of 1886.

Dr. Wendé was a charter member of the Western New York Veterinary Medical Association, a member of the New York Veterinary Medical Society and the American Veterinary Medical Association, which he joined in 1913. He held the office of State Veterinarian for Western New York, having been appointed twice under Commissioner Houston. He served as judge at the State Fair Horse Show for several years. Dr. Wendé was one of the best known veterinarians in the Empire State.

MRS. A. L. HIRLEMAN

Mrs. Therese Wentzel Hirleman, wife of Dr. A. L. Hirleman, B. A. I. Inspector in Charge of Hog Cholera Control Work and Tuberculosis Eradication in Georgia, died at Atlanta, Ga., November 24, 1923, after a lingering illness of almost six months. She was born in Cincinnati, Ohio, in 1873, and the body was taken back to her birth place for interment. She is survived by her husband, one son, her mother and two brothers. The sympathy of Dr. Hirleman's many friends, both in and outside the profession, goes out to him in his bereavement.

Our sympathy is extended to Dr. F. Carter Overton, whose father, Floyd C. Overton, was killed at Adams, N. Y., on December 5, 1923.

MARRIAGES

Dr. Henry Harrison Haigh (U. P. '11) to Miss Martha Shinn Smith, at Trenton, N. J., October 18, 1923.

Dr. Ralph A. Hendershott (O. S. U. '17) to Miss Elizabeth Irene Connor, both of Columbus, Ohio, September 25, 1923.

Dr. Robert Lowell McClarren (O. S. U. '22), of Delta, Ohio, to Miss Laura Tussing, of Reynoldsburg, Ohio, August 22, 1923.

Dr. and Mrs. John W. Adams, of Swarthmore, Pa., announce the marriage of their daughter, Alice Naomi Adams, to John Burriss West, at Trinity Church, Swarthmore, Pa., October 22, 1923.

BIRTHS

To Dr. and Mr. J. T. Doran, of Chappell, Nebr., a daughter.

To Dr. and Mrs. W. A. Wilkins, of Centralia, Ill., a son, October 20, 1923.

To Dr. and Mrs. A. B. White, of Grove City, Ohio, a daughter, September 23, 1923.

To Dr. and Mrs. E. Bruce, of Orchard, Nebr., a son, Ernest Junior, October 23, 1923.

To Dr. and Mrs. George W. Grim, of Ardmore, Pa., a son, William Webster, November 12, 1923.

To Dr. and Mrs. Ward Giltner, of East Lansing, Mich., a son, David, November 19, 1923.

To Dr. and Mrs. H. M. Hans, of Ponca, Nebr., a daughter, Severn Beata, December 11, 1923.

To Dr. and Mrs. J. L. Ruble, of Quitman, Ga., a daughter, Betty Yvonne, December 17, 1923.

To Dr. and Mrs. V. W. Yates, of Dyersburg, Tenn., a son, Charles William, September 25, 1923.

To Dr. and Mrs. Malcolm J. Harkins, of Conshohocken, Pa., a son, Francis Joseph, October 22, 1923.

To Dr. and Mrs. J. F. Shigley, of State College, Pa., a daughter, Dorothy Jane, November 24, 1923.

To Dr. and Mrs. H. H. Yocum, of Freelandville, Ind., a daughter, Betty Jean, September 14, 1923.

To Dr. and Mrs. M. D. Strong, of Stromsburg, Nebr., a son, Kenneth Dent, September 20, 1923.

PERSONAL

Capt. Chas. B. Dunphy (K. C. V. C. '16) is stationed at Fort Benning, Ga.

Dr. F. G. Roth (Ind. '17) of Crown Point, Indiana, is County Veterinarian.

Dr. Nicholas Rectenwald, of Pittsburgh, Pa., has recovered from his serious illness.

Dr. G. A. Handley (Chi. '04) is again back in Ohio. He has located at Jackson.

Dr. J. W. Huston (K. C. V. C. '18) is stationed at Des Moines, Iowa, 111 Federal Bldg.

Dr. J. R. Porteus (Corn. '18) has been transferred from Trenton, N. J., to Middletown, Del.

Dr. A. L. Faunce (Chi. '05) has been transferred from Kansas City, Kans., to Franklin, Nebr.

Dr. Harry J. Little (U. P.) of Williamsport, Pa., has been elected sheriff of Lycoming County.

Dr. Emil Krenek (K. C. V. C. '16), formerly at Augusta, Ga., is now at Morristown, Tenn.

Dr. R. H. Schrecengost (McK. '14) has removed from Swea City, Iowa, to Armstrong, same state.

Dr. Robert W. Pechin (U. P.) was elected Recorder of Deeds of Chester County (Pa.) at the recent election.

Dr. Robert L. Galt (U. P. '23) of Wuaryville, Pa., is secretary of the Conestoga Veterinary Club, of Pennsylvania.

Dr. A. E. George (Mich. A. C. '20) of Perry, Mich., has the rank of first lieutenant in the Michigan National Guard.

Dr. C. E. Lucas (Chi. '09) of Olney, Ill., is a breeder of Hereford cattle and one of the proprietors of Mash Creek Farm.

Dr. E. H. Riley (Geo. Wash. '11) is Associate Adviser of the Marhsall-Putnam Farm Bureau, located at Henry, Ill.

Dr. E. A. Rile (U. P. '06), of Bluebell, Pa., is constructing and equipping a canine hospital for his small animal patients.

Dr. J. E. Weinman (K. C. V. C. '13) has left St. Joseph, Mo., and located in Hutchinson, Kansas, at 137 E. 11th Street.

Dr. Jaime Bague (U. P.) is Sub-Commissioner of Agriculture and Labor of Porto Rico with headquarters at San Juan.

Dr. P. J. Huffman (K. C. V. C. '09), formerly in the meat inspection service at Urbana, Ohio, is located in Wheeling, W. Va.

Dr. Thomas W. Boman (A. P. I. '18) has been transferred from Moultrie, Ga., to Washington, N. C., in the B. A. I. service.

Lt. J. F. Crosby (Corn. '15) has been transferred from Carlisle Barracks, Pa., to the Army Medical Center, Washington, D. C.

Dr. Frank E. Allen (Chi. '11) has been transferred from Olympia, Wash., to Sacramento, Calif., in tuberculosis eradication work.

Dr. J. R. Houchins (U. S. C. V. S. '17) has changed his address from Red Springs, N. C., to 320 Agriculture Bldg., Raleigh, N. C.

Dr. Wm. J. Brown (Chi. '15) has been transferred from Mason City, Iowa, to Chicago, in the B. A. I. meat inspection service.

Dr. and Mrs. Joseph Hawkins (Ont. '71), of Detroit, Mich., celebrated their fiftieth wedding anniversary on December 23, 1923.

Lt. Col. R. Vans Agnew (Ont. '95) has been transferred from San Francisco to the Philippine Dept., with headquarters at Manila.

Dr. Robert N. Ashley (K. C. V. C. '08) has been transferred from Albuquerque, N. Mex., to South St. Paul, in the B. A. I. service.

Dr. O. A. Taylor (Mich. A. C. '15) of East Lansing, Mich., has been promoted to the rank of major in the Michigan National Guard.

Dr. Howard H. Custis (U. P. '07), who has been assisting Dr. Geo. S. Fuller, in Philadelphia, for several months, has located in Oxford, Pa.

Dr. R. Z. Mays (O. S. U. '20) has been transferred from Clemson College, to Columbia, S. C. His address is 901 Liberty National Bank Bldg.

Dr. T. S. Mason, of Tunica, Miss., recently met with a serious loss, occasioned by a fire which destroyed his home and all his household goods.

Dr. J. W. G. Hansen (Gr. Rap. '06), of Greenville, Mich., takes a very active interest in the Central Michigan Shorthorn Breeders' Association.

Dr. George E. Jacobi (O. S. U. '20), who has been Instructor in Veterinary Pathology at Iowa State College, moved to College Park, Md., January 1.

Dr. J. F. Park (A. P. I. '12) has been transferred from West Plains, Mo., to Topeka, Kansas, as B. A. I. Inspector-in-Charge, on Virus-Serum Control.

Dr. Leonard W. Goss (O. S. U. '05), of the Veterinary Faculty of Ohio State University, has received a commission as Major in the Officers' Reserve Corps.

Dr. Horst Schreck (Ind. '16) has formed a partnership with Dr. F. C. Schmidt, of Portland, Oregon, under the name of the Portland Dog and Cat Hospital.

Major Louis A. Beltran y Morena (U. P. '08), of Havana, Cuba, was in Philadelphia during November. While in the Quaker City he paid a visit to his alma mater.

Dr. John H. Winstanley (U. P. '10) attended the Farm Products Show, at Greencastle, Pa., in November, with an exhibit by the Pennsylvania Bureau of Animal Industry.

Dr. B. W. Conrad (K. C. V. C. '07) was a visitor in Chicago, in December, attending the meetings of the A. V. M. A. Executive Board and the U. S. Live Stock Sanitary Association.

Dr. R. P. Gingerich (Chi. '13), of Bloomington, Ill., has retired from active practice for a while. He expects to reside in California for a year and incidentally get back to his usual good health.

Dr. Thomas E. LeClaire (Laval '90), of Calgary, Alta., left shortly after Christmas for his winter home in Los Angeles, Cal. The Doctor expects to return to Calgary about the 15th of May.

Dr. Harry B. Cox (Amer. V. C. '95), of Philadelphia, Pa., was largely responsible for the success of a work horse parade held recently in the Quaker City. Twelve hundred horses were entered.

Dr. S. K. Andreassen (McK. '16), who has been practicing in Barnesville, Minn., for a number of years, has purchased the hospital and practice of the late Dr. L. G. Hart, Sr., at Chippewa Falls, Wis.

Dr. J. E. McCoy (K. S. A. C. '09) has relinquished his practice in Twin Falls, Idaho, and accepted a position as Instructor in Veterinary Medicine on the faculty of the Washington State College, at Pullman.

Dr. F. Sager (Corn. '17) has been transferred from Camp Devens to Fort Leavenworth. He recently enjoyed an extended vacation in Southern New York, while on leave, including a visit to Cornell University.

Dr. John H. Winstanley (U. P. '10) of the Pennsylvania Bureau of Animal Industry, supervised the exhibition of pathological specimens shown at the Farm and Garden Products Show, at Greencastle, in November.

Dr. H. N. Strader (Iowa '20), who has been stationed at New Hampton, Iowa, removed to DeWitt, Iowa, on January 1, to take charge of tuberculosis eradication work in Clinton County under the county-area plan.

Dr. John J. Mimnaugh (U. P. '23), of Long Island City, N. Y., and Frederick A. Grenfell (Geo. Wash. '14), of Washington, D. C., are taking special work at the University of Pennsylvania School of Veterinary Medicine.

Dr. Harry F. Kern (Colo. '11), who has been in the Philippine service for several years, has been transferred to the U. S. Bureau of Animal Industry, and is now in tick eradication work, with headquarters at Hertford, N. C.

Dr. T. E. Munce (U. P. '04) State Veterinarian of Pennsylvania, discussed the subject of "The Eradication of Tuberculosis in Animals," at the Farmers' Institute, in connection with the Farm and Garden Products Show, at Greencastle, Pa.

Dr. F. Torrance (Mont. '82), formerly Veterinary Director-General of Canada, is now a member of the teaching staff of the Ontario Veterinary College, being connected with the Department of Physiology, Bacteriology and Hygiene.

Dr. B. M. Underhill (U. P. '95), on Dec. 10, 1923, gave a lecture before the Delaware County (Pa.) Institute of Science, on "The Theories of Immunity." Dr. Underhill also represented the Institute at the Centenary Celebration of the Birth of Joseph Leidy, held in Philadelphia, recently.

Dr. E. T. Baker (O. S. U. '09) of Moscow, Idaho, continues to edit *The Two Forty-Niner*, the official organ of B. P. O. E. No. 249. In a recent number the prophecy was made (confidentially) that the price of wheat will either advance, remain stationary or take a slump. Very much Bakeresque.

Dr. William Sheppard (R. C. V. S.-London '70), for many years located at Sheepshead Bay, New York, has moved to Florida. He is located at De Land. Mrs. Sheppard will continue to raise Pekingese. Her Minoru Kennels boast such outstanding individuals as Pun Chun of Minoru, Star of Minoru and Pao Wong.

Dr. D. H. Udall (Corn. '01) attended the recent meeting of the U. S. Live Stock Sanitary Association, as a delegate from the New York State Veterinary Medical Society, and in the interests of the practitioners of the Empire State relative to tuberculin testing. Needless to say he gave a good account of himself. Speaking briefly, he got what he went after.

Dr. L. L. Glynn (N. Y.-Amer. '08) was recently appointed a member of the Colorado Veterinary Medical Examining Board by Governor Sweet. Dr. Glynn served as House Surgeon in the New York American Veterinary College Hospital for two years and then entered the United States Bureau of Animal Industry, resigning in 1918 to take up general practice in the San Luis Valley in Colorado. He is now located at Monte Vista, Colo., in general practice.

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 735 Book Building, Detroit, Mich.

C. H. STANGE, President, Ames, Iowa.

M. JACOB, Treasurer, Knoxville, Tenn.

Executive Board

GEO. HILTON, 1st District; T. E. MUNCE, 2nd District; D. S. WHITE, 3rd District;
J. A. KIERNAN, 4th District; C. E. COTTON, 5th District; B. W. CONRAD,
6th District; CASSIUS WAY, Member at Large, CHAIRMAN.

Subcommittee on Journal

D. S. WHITE

J. A. KIERNAN

The American Veterinary Medical Association is not responsible for views or statements published in the JOURNAL, outside of its own authorized actions.

Reprints should be ordered in advance. Prices will be sent upon application.

Vol. LXIV, N. S. Vol. 17

February, 1924

No. 5

WHO CAN TELL?

A letter recently received from one of our members, who had fallen somewhat behind with his dues, contains the following food for thought: "Business good but no collections. Farmers have no cash. Money grabbed by bankers for machinery and tractors, sold when times were good."

We were reminded of a paragraph we had read in one of Secretary Dinsmore's newsy letters to members of the Horse Association of America, as follows:

"A banker, who has recently loaned from four to five million dollars per month on farm lands, writes me that he has instructed all correspondent banks to do everything possible to discourage the purchase of tractors or trucks by farmers."

Who will ever be able to tell how much of the present difficulties, principally financial, in which our farmers find themselves, is not attributable, either directly or indirectly, to assuming obligations for tractors, trucks, automobiles and other expensive machinery that they were cajoled into buying by slippery-tongued salesmen, who were more deeply interested in commissions than agricultural prosperity?

One of the most sensible suggestions that has been made, aimed to aid the farmers in general, and those who grow wheat

exclusively, in particular, has been made by President Coulter, of the North Dakota Agricultural College. He advocates a federal loan of \$50,000,000 to farmers, for the purpose of assisting them to purchase live stock, and thereby to diversify their farming operations.

A LEGISLATIVE PROGRAM

Our Committee on Legislation has its work cut out for it this year. There are no less than five matters which need national legislative attention, and in which all veterinarians should be interested.

Senator Copeland, of New York, has introduced a bill (S-1671) providing for the compulsory testing of clinical thermometers. Our Association was invited to send a representative to a conference held under the auspices of the Bureau of Standards, in Washington, D. C., on January 30th, for the purpose of discussing the merits and demerits of the proposed bill. In this connection, it should be kept in mind that several millions of clinical thermometers are made and sold in this country each year, and, except in a negligible number of instances, the purchaser has no means of assuring himself of the reliability of the instrument purchased. As we see it, the greatest good to come of a law passed by Congress will be the deterring effect upon legislation of this kind by individual states, and the setting up of just as many different standards.

It is hoped that a bill will be introduced in the present Congress along the lines of a bill introduced last year, reducing the tax paid by veterinarians and physicians under the Harrison Narcotic Act. This act originally fixed a tax of \$1.00 per year, but the Revenue Act of 1918—a war measure—increased the rate to \$3.00. The amount collected under this act during the year 1922 was over \$600,000 in excess of the amount expended during the same year. The tax collected is paid into the general revenues of the United States, and does not go directly towards the enforcement of the act. The present tax is looked upon as essentially an occupation tax on veterinarians and physicians, and, as such, represents a discrimination against the veterinary and medical professions, since Federal occupation taxes are not imposed on other professions.

The Commissioner of Internal Revenue has ruled that a physician, who is away from home in attendance at a meeting

of a medical society, or while pursuing post-graduate study, is not away from home in the pursuit of his profession, and that the expenses incident to such travel and study are not ordinary and necessary expenses of the practice of medicine. Such expenses are regarded by the Commissioner as merely personal expenses, such as are covered by the provisions of the Income Tax Law, which allow to all tax-payers, without regard to their callings, or to the necessity for travel imposed by such callings, certain exemptions to cover personal expenses. Obviously, this ruling ignores the fact that such expenses arise in the case of a veterinarian or physician as expenses of his professional work, and the present interpretation is not in harmony with the provisions of the law generally, as they relate to medical practice.

We see another strong argument to show that the present ruling is unjust, in that a business man may deduct analogous traveling expenses (incurred in attending meetings of trade organizations, sales promotion conventions, etc.) as incident to the conduct of his business, in the computation of Federal income taxes. This apparent injustice has already been called to the attention of the Treasury Department Committee, studying such matters, but in the event of unfavorable action by the committee, the American Medical Association is planning to bring the matter to the attention of Congress. Our members should join hands with our sister profession in this worthy undertaking.

The attention of the Association has been directed to the apparent injustice of the present ruling in the matter of the allowance of alcohol for veterinarians. At present, veterinarians are allowed no more alcohol than is allowed to dentists, even though the only use to which a dentist puts alcohol is in connection with the annealing of gold. Veterinarians are now limited to two gallons of alcohol per year, and it is believed that this amount is entirely too small for the needs of this drug in connection with its therapeutic use in large animals.

Another matter which has been drawn to the attention of our Legislative Committee is the desirability of having apomorphin dropped from the list of drugs covered by the Harrison Narcotic Act. It has been pointed out that apomorphin is in no sense a habit-forming drug, and even though it is an opium derivative, it should not be classified with opium and morphin as a habit-forming drug. There is one possible objection in seeking legislative relief in this direction, however, and that is for the reason

that it might pave the way for other amendments that would weaken the present act.

Members interested in these problems and having any suggestions to offer should communicate with the Chairman of our Committee on Legislation, Dr. J. G. Ferneyhough. The committee is hampered neither by lack of funds or experience, and is in an excellent position to give a good account of itself this year.

IT WORKS BOTH WAYS

During the month of November the United States Department of Agriculture issued no less than three press releases directing attention to the increase in hog cholera. The first of these bore the caption, "One Hog in Twenty-five Dies of Cholera," and the opening statement was to the effect that "approximately four per cent of the hogs on farms in the United States died of hog cholera last year." The second of these articles carried the caption, "Hog Cholera on the Increase." The third called attention to the increase in hog cholera and "flu."

The purpose of these articles was undoubtedly good and they were unquestionably designed to call the attention of farmers to the fact that hog cholera is a preventable disease. Unfortunately, however, some or all of these press releases were used by the large city dailies and about the only part of the releases used by these dailies was the fact that hog cholera was on the increase and that one out of every twenty-five hogs dies of cholera. The effect produced on the average reader, by these newspaper articles, was to make him think that hog cholera is still the same menace that it was before the advent of anti-hog cholera serum.

To bear this out, we will repeat the casual remark of a layman who had read a newspaper version of one of these releases from Washington. His remark was: "You veterinarians still do not seem to be able to do much with hog cholera." This is to be regretted all the more, at this particular time, when other agencies are striving to direct attention to what the veterinary profession has accomplished in the control of hog cholera. This view of the situation, of course, was not the one intended by our Department of Agriculture, but it made a better piece of news to emphasize the heavy death rate for 1923.

DIRECTORY IN PRESS

The new Membership Directory is now in press, the first one to be published for three years. It should fill a much-felt need, not only by resident secretaries, officers and committeemen, but by our entire membership. We have a suggestion to make. When you receive your copy, see if your nearest fellow-practitioner is listed as a member. If not, find out why. Get him to join.

COMING VETERINARY MEETINGS

Wisconsin Veterinary Medical Association and Veterinary Short Course. College of Agriculture, Madison, Wis. Jan. 29-30-31 and Feb. 1, 1924. Dr. O. H. Eliason, Secretary, Madison, Wis.

Alabama Veterinary Practitioner's Short Course, Auburn, Ala. Feb. 4-9, 1924. Dr. C. A. Cary, Dean, Auburn Ala.

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York City. Feb. 6, 1924. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.

San Joaquin Valley Veterinary Medical Association. Hotel Selma, Calif. Feb. 6, 1924, 7:00 p. m. Dr. H. B. Wintringham, Secretary, 616 Broadway, Fresno, Calif.

Kentucky Veterinary Medical Association. Hotel Latham. Hopkinsville, Ky. Feb. 6-7, 1924. Dr. J. A. Winkler, Secretary, Newport, Ky.

Kansas Veterinary Medical Association and the Third Annual Conference of Kansas Veterinarians. K. S. A. C., Manhattan, Kans. Feb. 6-7-8, 1924. Dr. I. J. Pierson, Secretary, Lawrence, Kans.

Manitoba, The Veterinary Association of. Manitoba Agricultural College, Winnipeg, Man. Feb. 7, 1924. Dr. J. B. Still, Secretary, 711 Boyd Bldg., Winnipeg, Man.

Alabama Veterinary Medical Association. Feb. 8, 1924, Auburn, Ala. Dr. C. A. Cary, Secretary, Auburn, Ala.

Missouri Valley Veterinary Association. Kansas City, Mo. Feb. 19-20-21, 1924. Dr. E. R. Steel, Secretary, Grundy Center, Iowa.

Massachusetts Veterinary Association. American House, Boston, Mass. Feb. 27, 1924. Dr. C. H. Playdon, Secretary, Reading, Mass.

NO-LESION TUBERCULIN-REACTING CATTLE¹

By E. C. SCHROEDER, *Bethesda, Md.*

Superintendent, Experiment Station of the U. S. Bureau of Animal Industry

Among the disturbing factors with which the bovine tuberculosis eradication campaign has been forced to contend is the occurrence of so-called, no-lesion reactors, or cattle that react with tuberculin tests and in the bodies of which the post-mortem examination fails to reveal macroscopic lesions of tuberculosis.

This is a matter, as most men engaged in tuberculosis eradication work have learned through practical experience, that urgently requires investigation, not alone because it is desirable that its significance should be defined, but also to prevent its misuse by the enemies of eradication as an argument against the reliability of tuberculin as an agent for detecting tuberculosis, and, consequently, as it is generally admitted that the eradication of tuberculosis among the lower animals without the use of tuberculin is hopeless, as an argument against the whole, now active and promising bovine tuberculosis eradication program.

The commonly insidious and slowly progressive nature of tuberculosis, and the lack of information derivable from a tuberculin test, regarding the extent and age of the lesions in the body of a tuberculous subject, could well have served as the basis for the prediction, when it was undertaken to test hundreds of thousand and millions of cattle with tuberculin, that a fairly large proportion of instances would be encountered among tuberculin-positive animals, true subjects of tuberculosis, which had become infected too recently for macroscopically discoverable lesions to be present at the time of the test, slaughter and post-mortem examination. From some points of view it is really less surprising that no-lesion, tuberculin-reacting cattle are found than it is that they are not more numerous than experience has shown them to be, and that a large proportion of so-called, no-lesion, reacting cattle are true cases of tuberculosis, though occult to our unaided senses, is irrefutably proved by studies made in the Division of Pathology of the United States Bureau of Animal Industry during the last five years.

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

Last June I asked the Division of Pathology to give me a record of the no-lesion, tuberculin-reacting cattle from which it had obtained and studied material, and the more interesting and instructive portion of the data supplied me may be tabulated briefly as follows:

Year	Cases Studied	Proved Tuberculous	Per cent
1919	176	85	48.29
1920	799	197	24.65
1921	1296	258	19.90
1922	1422	290	22.37
1923	373	76	20.37

Total cases studied, 4066; proved tuberculous, 906, or 22.28%.

The earlier cases studied were all subjected to both microscopic examination and animal inoculation tests. Some of the later cases were not subjected to animal inoculation tests, but this, in view of the fact that the percentage proved to be infected with tuberculosis was greatest in the first year, should be looked upon as a reason for concluding that the percentages of later years are too low rather than as a factor that militates against their use as evidence to prove that macroscopically occult tuberculosis is very common among so-called, no-lesion, tuberculin-reacting cattle.

The decline in the percentage of cases proved to be tuberculous after the first year probably is due to the shorter time that was or could be devoted to the study of each case after the first year, and not to an actual decline of the percentage frequency with which the cases studied after the first year were affected with tuberculosis. But, if we disregard this probability and use the percentage of cases proved to be tuberculous among the whole 4066 studied during the five years as an index or guide, we may reasonably formulate a statement like the following:

If we keep in mind how difficult it is to select the proper material to search for evidence of tuberculosis from the large body of a no-lesion, tuberculin-reacting, bovine animal, and that at most only a few grains of material from each such animal can be thoroughly studied, the concrete evidence we now have to prove that more than twenty-two out of every hundred no-lesion, tuberculin-reacting animals are true cases of tuberculosis, justifies the conclusion that a great majority of no-lesion, tuberculin-reacting cattle are true cases of tuberculosis.

It is an instance in which the known facts about tuberculosis and tuberculin sensitiveness should have prompted the conclusion before concrete evidence was obtained, and in which the concrete evidence supports the conclusion which is theoretically correct, or an instance in which the circumstantial and the direct evidence are in complete agreement.

They who have had practical experience in the study of macroscopically occult cases of tuberculosis among cattle will not fail to recognize the conservative character of these statements. For example, my own experience includes an animal, in the early days of the use of tuberculin to diagnose tuberculosis among cattle, which reacted perfectly but was not proved to be tuberculous until after several competent investigators had spent each more than an hour on the microscopic examination of the most likely, or the most promising, material that could be obtained from it at an experiment station and not a slaughter-house autopsy. I also remember a number of instances in which tuberculin reactions among cattle were not explained until long and tedious post-mortem examinations, of a searching kind which certainly are not possible at slaughter-houses, revealed tuberculous lesions in unusual and unexpected locations, or in regions of the body in which tuberculous lesions are rarely found even in advanced and practically generalized cases of tuberculosis.

The insidious and often concealed nature of tuberculosis is well recognized by investigators, as the following quotations from the book on, "Tuberculosis in Man and the Lower Animals," published last year by Dr Albert Calmette, Associate Director of the Pasteur Institute, at Paris, show. Calmette says:

"Infection first occurs unobtrusively and remains latent in the lymph or blood system for a longer or shorter time and discloses its existence only by conferring upon the infected organism the capacity to react to tuberculin."

He also says:

"Tuberculin has frequently been accused of having given a false indication because no tuberculous lesions could be found,"
and that,

"It was proven however long ago that in these circumstances the organs had not been searched with sufficient care,"
and that,

"Whenever a tuberculin reaction is positive, there exists somewhere a follicular lesion or at least a gland containing tubercle bacilli whose presence can be disclosed by experimental inoculation of the guinea pig."

The quotations from Calmette's book are important for three reasons: first, because the book undoubtedly is the most important, general summary of our knowledge on tuberculosis in man

and the lower animals published in recent years; second, because its author has devoted many years of study to tuberculosis in man and the lower animals and is widely recognized as an authority of the highest rank on the subject; and third, because one of his associates and co-workers is an accomplished veterinarian.

The last reason should be particularly interesting to the layman, as it requires no great acumen to comprehend that we cannot hope to gain a thorough knowledge of a disease which is widespread and common among men and the lower animals, and the long attempted control of which has begun to yield encouraging results only in recent years, unless veterinary and human medical knowledge and ability cooperate to discover and explain its mysteries.

Before proceeding it may be well to say that spontaneously healed or arrested tuberculosis among cattle has not been proved to be as common as among man, and that we have no valid reasons for assuming that cattle which react with tuberculin and show no other symptoms of tuberculosis are safe associates for tuberculosis-free animals in a sufficiently large proportion of cases to require special consideration from the point of view of possibly healed or arrested tuberculosis. It is better frankly to recognize that such evidence as we have proves that approximately forty per cent of all apparently healthy cattle that react with tuberculin are actual disseminators of tubercle bacilli.

Now, though it seems clear that most co-called, no-lesion, tuberculin-reacting cattle are macroscopically occult and incipient subjects of tuberculosis, there is no doubt that this does not fully settle the question of all no-lesion, reacting cattle, and at the Experiment Station it has long been known that tuberculin sensitiveness can be caused in several ways that may have practical significance in this connection.

Tubercle bacilli of the human type do not cause progressive tuberculosis in cattle; in fact, it has not been proved that they cause visible lesions of any kind in cattle unless they become lodged in tissues from which they are eliminated very slowly or not at all. The lodgment of the bacilli in such tissues is rare under natural conditions of exposure but is commonly effected through artificial inoculations. When cattle are drenched with human tubercle bacilli suspended in water, or with ground tuberculous lesions from human tuberculous subjects suspended in water, subsequent post-mortem examinations do not reveal

tuberculous lesions, but such cattle in some cases, not in all, react with tuberculin.

A peculiarity about their tuberculin sensitiveness is that it wholly disappears after the effects of a single, subcutaneous injection of tuberculin have passed off. That is to say, they react once and not again with a later test, and this peculiarity they have in common with cattle that have been sensitized for tuberculin through subcutaneous injections of pure cultures of tubercle bacilli of the human type, or through injections of tuberculous tissues from experiment animals that have been infected with tubercle bacilli of the human type, which is noteworthy, as the subcutaneous injection exposures almost invariably cause tuberculous lesions at the seats of injection, lesions which, though they soon become stationary and are afterwards slowly absorbed, contain virulent tubercle bacilli practically as long as they retain their tuberculous character.

Killed tubercle bacilli injected subcutaneously into cattle also cause a temporary tuberculin sensitiveness. In guinea pigs the sensitiveness caused by dead tubercle bacilli develops about as quickly as that caused by living tubercle bacilli; gradually increases until its maximum is reached; remains stationary for a number of weeks, and then seems slowly to decline.

Among the ways in which cattle can be sensitized with either living human tubercle bacilli or with dead tubercle bacilli, two require consideration, and one is of possible great practical importance, as causes of no-lesion reactions among cattle.

One is sensitization with dead tubercle bacilli, the importance of which now is negligible, as dead tubercle bacilli, which were quite common in tuberculin several years ago, virtually have been eliminated from it, or occur in it in such small numbers that they cannot account for sensitiveness to tuberculin among no-lesion cattle that are repeatedly tuberculin tested.

There is no reason to excuse the presence of dead tubercle bacilli in tuberculin, and I am glad to say that tests of commercial tuberculin manufactured and sold in the United States under Government license during the last year revealed no tubercle bacilli, either dead or alive.

The more important of the two ways is the sensitization of cattle through the ingestion of tubercle bacilli of the human type.

I feel confident that cattle which react with tuberculin and afterwards fail to show lesions of tuberculosis, and in which the

reaction cannot be accounted for on the basis of incipient and macroscopically concealed lesions, because they have in no way been exposed to bovine infection, on investigation will often be found to be cattle that have been exposed more or less severely to ambulant, careless, human subjects of tuberculosis.

As I stated in referring to the subject in an address on tuberculosis made several months ago, I know of one instance in which the feed of a number of no-lesion reaction cattle was prepared by an individual who shortly afterwards died of pulmonary tuberculosis.

No great imagination is required to picture a suffering, uneducated, tuberculous individual, to whom the preparation of the feed for cattle is intrusted, coughing over and actually spitting into the mixture. Tubercle bacilli in the sputum of advanced case of pulmonary tuberculosis often are very abundant.

It seems eminently desirable that all veterinarians engaged in bovine tuberculosis eradication work should gather data on the frequency with which no-lesion, tuberculin-reacting cattle, which cannot be looked upon as undeveloped cases of bovine tuberculosis because they have not been exposed to bovine bacilli in any discoverable manner, have been exposed to human tuberculous individuals.

While the human type of the tubercle bacillus does not cause tuberculosis in cattle, and human adults are strongly resistant against the bovine type of the tubercle bacillus, no difference has been recorded in the sensitization for tuberculin either type of the bacillus causes in animals into which they are introduced, and no differences have been recorded in the kinds of tuberculin the two types of bacilli produce.

Notwithstanding the commonly strong resistance of cattle against tubercle bacilli of the human type, it is not improbable that their persistent exposure to tubercle bacilli of the human type, freshly expelled by tuberculous persons, may lead to the development of tuberculous lesions in their bodies, which, after moderate and slow growth, become stationary and retrogressive. This probability is quite in harmony with some of the observations made at the Experiment Station fifteen to eighteen years ago during studies on so-called bovo-vaccination against tuberculosis among cattle. Bovo-vaccination required the intravenous injection of tubercle bacilli of the human type into cattle, and it was found that the frequency with which lesions resulted from such, ostensibly protective injections increased at an alarming

rate when repeated injections into the same animals were made, justifying the conclusion that persistent, intense exposure to tubercle bacilli of the human type may engender tuberculous lesions in the bodies of cattle.

Such lesions commonly were in unusual locations, and probably were of no importance with regard to the spread of tuberculosis among cattle, and somewhat similar lesions if caused by the exposure of cattle to human tuberculosis subjects would contribute nothing to the spread of tuberculosis among cattle. But, when meager lesions of tuberculosis are found in cattle, especially if they have an unusual character or an unusual location, and there is no way to explain their occurrence by discoverable exposure of the cattle to bovine, tuberculous infection, they would make interesting material to study with regard to the type of the tubercle bacillus they contain.

DISCUSSION

DR. V. A. MOORE: I am sorry that I heard only a part of the paper. I would like to ask for information. Do I understand you got the same reaction with tuberculin from any source, whether avian, bovine or human type? My experience with that in the past has been quite different—that you wouldn't get the reaction with the avian tuberculin, or we couldn't get a reaction in avian infections with the others. I wonder if that finding was in error.

DR. SCHROEDER: Dr. Moore, I did not speak of avian tuberculosis. I made the statement that no difference had been detected in the kind of sensitization produced by either the human or the bovine type of tubercle bacilli and that no differences had been discovered in the kinds of tuberculin, which either human or bovine tubercle bacilli produce. Avian tubercle bacilli and tuberculin are a different matter. Animals affected with avian tuberculosis, when tested with either human or bovine tuberculin, show a tendency to react, but nothing sufficiently marked to be practically serviceable, and the same has long been known to be true when animals affected with human or bovine tuberculosis are tested with avian tuberculin.

DR. J. A. KIERNAN: Reports were received during the year, covering the slaughter of 107,250 head of cattle. As close supervision as was possible was again given this work in order to reduce to a minimum the number of no-lesion cases appearing. These reports indicate that a fractional part of one per cent more no-lesion cases were found than during the previous year. In order to ascertain the source of these cases, investigations were instituted which disclosed the fact that 72.2 per cent of the cases in which no visible lesions were disclosed originated in infected herds. Of this 72.2 per cent, approximately 22 per cent were found in herds containing cases of generalized tuberculosis.

These figures seem to indicate that the situation is not quite so serious as would appear upon the surface, as the actual figures show that only 2,756 such animals, out of 107,250 reactors slaughtered, came from herds in which infection was not demonstrated by actual post-mortem examination. This is only 2.5 per cent in which it would appear that there were any doubts as to the diseased condition of the cattle. Based upon the total cattle tested (3,460,849) the possible error is only 0.08 per cent. In addition to the above, reports received indicate that 11.9 per cent of the total reactors were condemned as unfit for food purposes; that 1.4 per cent were sterilized; that 17.3 per cent were classified as undoubted spreaders of the disease; that 0.5 per cent were shown to have udder lesions; that 3.1 per cent were shown to have skin lesions, and that 0.7 per cent were found to have disclosed obscure lesions, other than the udder or skin lesions mentioned. These other obscure lesions,

it may be mentioned, were found in every conceivable part of the animal body, about sixty such unusual locations having been reported.

Of unusual interest in connection with reports of no-lesion cases is a study of tables which indicate that the lowest per cent of these cases reported over a period of three years was during the month of July of each year, and further, that this percentage gradually rose each month during each of the three years to the month of February, which showed the highest percentage of no-lesion cases. During the remaining four months of each fiscal year, a gradual reduction in percentage took place. This study, which may appear as only coincidental, is worthy of further attention, which it will receive during the present year.

DR. V. A. MOORE: I would like to inquire whether I understood correctly, that in 0.8 per cent there were microscopic lesions where macroscopically there were no lesions?

DR. KIERNAN: There were certain herds apparently free from tuberculosis in which a limited number of reactors were found. These animals, on slaughter, showed no lesions of disease. The percentage of such cases, based on the total cattle tested, was .08 percent.

DR. H. W. TURNER: In herds that have been tested a number of times, and have apparently been freed from tuberculosis, we often find in subsequent tests a number of animals giving a typical reaction, which on post mortem show no lesions. How do you account for this condition?

DR. SCHROEDER: Dr. Turner, I know nothing about such herds from practical experience. We must assume that the reacting animals in such herds have been exposed to tubercle bacilli, and I know that cattle that have been exposed to tubercle bacilli of the human type, though they fail to show lesions, may react with tuberculin. If cattle that react with tuberculin in supposedly cleaned herds are found to show meager tuberculous lesions, particularly if the herds are owned by institutions that number ambulant tuberculous subjects among their inmates, it would be very interesting to study the types of the tubercle bacilli that can be isolated from the lesions. I believe that by such studies we might secure concrete evidence that would throw light on this difficult matter, for which the explanation so far has remained largely theoretical.

DR. H. W. TURNER: These were state institution herds, where the animals are always more or less exposed to the possibility of human infection.

DR. J. A. ALLEN: I would just like to ask Dr. Schroeder what possibility there is of animals becoming sensitized after the repeated injection of tuberculin, or whether that would have any influence at all in the cases to which he has referred?

DR. SCHROEDER: The repeated injection of tuberculin would sensitize an animal only if the tuberculin contained dead tubercle bacilli in considerable numbers. I have tried to sensitize not only cattle but also small experiment animals by injecting them with single small doses, with single large doses and with repeated small and large doses of tuberculin, and I have never seen an instance in which an animal became sensitized as the result of such injections.

DR. E. A. WATSON: From the laboratory point of view, in saying that a case is negative to animal inoculations, how many glands or sets of glands, Dr. Schroeder, do you consider it necessary to inoculate before you can say whether that, from an inoculation point of view, is negative; that it might be due to tubercle bacilli?

DR. SCHROEDER: I am unable to answer Dr. Watson's question. As I pointed out in my paper, the data I presented were secured by the Division of Pathology of the U. S. Bureau of Animal Industry. I understand the glands selected were those that showed small hemorrhagic areas, or possibly small patches of edema. How many glands or how much material was studied from each animal, I do not know.

We are never certain that a tuberculin-positive animal is free from tuberculous lesions; therefore, as the reaction may be due to a focus of tuberculosis which is not found, we cannot know with certainty whether the reaction in an

animal in which no lesions are found is due to an undiscovered lesion or to the presence of tubercle bacilli that have caused no lesions.

DR. F. W. SCHOFIELD: I am not surprised at Dr. Turner's difficulty. It is to be expected in a herd that has been rendered free from tuberculosis. This herd is now tested annually to detect the presence of tuberculosis. Therefore, any lesions which occur are bound to be less than one year of age. Therefore, reactors, when slaughtered, are not likely to show very extensive lesions.

When we consider how farmers will still bring dairy products to their farm and feed it to the pigs, you have in some cases bovine tuberculosis existing in the pigs on the farm, for instance, and also I have seen cattle, from which tuberculosis has been nicely eradicated, mixing with the cattle on the next farm.

But the point I want to get at is that there are sources of infection surrounding that herd, and if you are going to get it, you are going to get it within one year after inoculation, which will possibly not be with very advanced lesions.

CHAIRMAN REED: Is there any further discussion?

MR. J. H. WHITTLESEY: I should like to ask whether avian tuberculosis in bovine animals is not exceedingly rare, but when it does occur it would not account for no-lesion reactions. On the contrary, as the tuberculin used to test cattle is the product of human and bovine tubercle bacilli, it is probable that some cattle which show tuberculosis lesions, though they do not react, may be the subjects of avian tuberculosis.

DR. R. L. CONKLIN: Mr. Chairman, I would like to ask Dr. Schroeder how long he believes an animal may be infected with tuberculosis of the bone, under a government test, before a reaction may occur?

I had occasion to test a cow which had come from an accredited herd in the State of Vermont and was purchased here in Canada and kept isolated until a year after the animal had been shipped here, and on the second test, testing it six months after arrival and a year after arrival, the animal reacted, and when slaughtered was found to have badly diseased lung and liver. I wrote to the Department, in Washington, and ascertained that this herd had been accredited for some time and no reactors had been found previous to the time this animal was shipped. I would like to know if he can give me any information as to the probable duration of this infection in this animal?

DR. SCHROEDER: It is difficult to determine from an examination of the lesions how long an animal has been affected with tuberculosis, because tuberculosis in some instances is a rapidly and in others a slowly progressive disease.

I believe that bone tuberculosis in cattle would rarely occur unless tuberculosis was present in other parts of the body, and when it does occur I do not believe that the time after its development, before the animal becomes sensitive to tuberculin, would be either longer or shorter than from tuberculous disease elsewhere.

Concerning the reaction or the failure to react of a single animal, such as Dr. Conklin has described, the possibilities of infection are so numerous that it is not unreasonable to conclude that the animal became infected after, rather than before, its removal from an accredited herd.

DR. SCHOFIELD: Are you sure, sir, that the lesion in the bone was a tubercular lesion?

DR. CONKLIN: It was tested upon experiment animals.

One thousand buffaloes will be taken from the Wainwright, Alberta, herd, and released in the region in which wood buffaloes are found. This is necessary because of the increasing size of the Wainwright herd.

DAMAGED SWEET CLOVER: THE CAUSE OF A NEW DISEASE IN CATTLE SIMULATING HEMORRHAGIC SEPTICEMIA AND BLACKLEG¹

By FRANK W. SCHOFIELD, D. V. SC., *Guelph, Ontario*
Pathologist, Ontario Veterinary College

INTRODUCTION

Among many agricultural communities in North America an erstwhile noxious weed—sweet clover,²—has within a decade become recognized as a farm crop of remarkable value. The very general success of the crop has resulted in a tremendous increase in the acreage sown to sweet clover. In districts where the cultivation of corn for ensilage was threatened by the corn-borer, sweet clover has been introduced as a substitute. On light, gravelly soil, where other crops frequently perished, sweet clover was found to prosper. It is both chemically and physically beneficial to the soil, and in comparison with corn is more economical and convenient to handle in the production of ensilage. Under such circumstances the rumor that sweet-clover ensilage and hay was responsible for the death of cattle in widely separated districts of the Province of Ontario was a matter of much concern to the farmers and resulted in an immediate investigation.

HISTORICAL NOTE

During the winter months of 1921-22 many occurrences of a somewhat mysterious disease of cattle were reported to the College by local veterinarians. The early age of the animals attacked, combined with the peculiar location of the subcutaneous swellings, frequently resulted in an erroneous diagnosis of blackleg. When post-mortem examinations were made the discovery of numerous, large and small hemorrhages sometimes led to the verdict of hemorrhagic septicemia. Animals which were apparently quite healthy were reported as dying within a few hours after the operation of dehorning. A careful inquiry elicited the fact that in every case sweet clover had been included in the diet of the deceased animals.

Because of its excellence as a general description of the disease, mention must be made of an unpublished report which was

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

²There are several different species of sweet clover. *Melilotus alba* or white sweet clover is the species most frequently grown as a farm crop.

kindly prepared for the writer by James Brown, B. V. Sc., Markham, Ontario.

SYMPTOMS

At least two types of the disease are recognizable, viz., (1) the acute or hemorrhagic; (2) the subacute or anemic.

Symptoms of the acute type. The disease is often so sudden in its onset that the first indication of an outbreak is revealed by the carcass of a victim. On the other hand well marked and characteristic symptoms may be present. These are: Rapid pulse, blanching of the visible mucous membranes, and the presence of subcutaneous swellings. The animal is usually dull, standing quietly in the stall, and will often continue to take a little food until a short time before death. The temperature is not elevated but may be subnormal. When made to walk a stiffness in the movements is discernable. Constipation is common and impaction of the rumen has been reported. Slight bloating before death commonly occurs, while after death the whole carcass rapidly becomes distended with gas.

In fatal cases the animal becomes weaker, the pulse markedly accelerated, the visible mucous membranes very white, while the swellings may increase in size and number. The animals, in most cases, die quietly and in such a natural position that the fact of death may not be realized until some time after this has occurred. Occasionally posterior paralysis or cerebral symptoms are seen. In cases which go on to recovery the color gradually returns to the mucous membranes, the pulse becomes fuller and stronger, and the animal looks brighter and eats more heartily. The swellings pass away slowly. Death in this type of the disease is almost always the direct result of hemorrhage. In many cases the hemorrhage is exclusively internal, no exterior evidence being apparent. In such cases the diagnosis is facilitated by estimating the hemoglobin content and the clotting-time of the blood.

The nature of the swellings. The value of these lesions in making a differential diagnosis is of sufficient importance to warrant special consideration. A typical swelling contains no gas, is not hot, only slightly painful, and has no tendency either to suppurate or slough. These facts taken in conjunction with the rapidity of their formation indicate the non-inflammatory nature of the lesions. The swellings may either pit on pressure or fluctuate depending upon the rapidity with which they have formed. Most of the swellings contain either coagu-

lated or uncoagulated blood. Some are, however, purely edematous. They vary greatly in size, the smallest being scarcely perceptible while the largest may measure several feet in circumference with an elevation of many inches. They may appear on any part of the body but occur with greatest frequency along the back on either side of the vertebral column. They may be subcutaneous or intramuscular.

The subacute or anemic type. There is a possibility of misleading the reader by the use of the word "subacute." In this type the death-rate may be high but the disease is never so explosive as in the acute form. All cases cannot be classified under these two heads yet the majority conform quite definitely to one or the other of these types. It is impossible to give any constant symptoms for this form of the disease, as up to the present time the diagnosis has always been made at the same time as the post mortem. It is more than probable that in many cases no symptoms of disease could be detected even though a careful examination were made before death. Included here are the cases of death following dehorning, parturition, and simple operations. In all of these cases the blood has been altered in at least one very important way, that of a delay in the clotting-time. Animals suffering from the subacute form of the disease die within a few hours after dehorning. Such animals bleed to death, due to the failure of the blood to coagulate. Out of a total number of twenty-two animals distributed among five different groups, and all being fed upon damaged sweet-clover hay, twenty-one died following the operation of dehorning.

Some interesting cases of the anemic type were discovered by a farmer who, following the traditions of the elders, cut a slice of skin and cartilage from the ears of all his yearling cattle and then retired for the night. This was to have had the mysterious effect of a blood tonic. The application of ligatures on the following morning saved his cattle from immediate death, but due to a continuation of the feed they all succumbed to the hemorrhagic type within a few weeks.

This form of the disease has been reproduced in rabbits, where the clotting-time of the blood was greatly delayed, the hemoglobin reduced, and the red blood cells badly damaged. A diagnosis can best be made by an examination of the blood.

MORBID ANATOMY

The acute type. The subcutaneous vessels are usually col-

lapsed and contain a little pale blood. The swellings are either purely hemorrhagic or partly edematous. When the latter are incised serum flows freely. Large and small hemorrhages occur with great frequency. The muscles are pale except when extravasated with blood. The healthy-looking flesh and sweet smell of the carcass do not suggest infection. The abdominal cavity usually contains much fluid and sometimes blood, clotted or free. Subperitoneal hemorrhages are very numerous and vary in size from mere petechiae to extensive suffusions, both in the visceral and parietal peritoneum. The rumen is usually covered with subserous hemorrhages. Ecchymoses are frequent in the small intestine.

Liver. Diagnostic punctate hemorrhages are almost always found in this organ. They appear as small circular black spots below the capsule. Pale areas of degeneration can usually be found.

Kidney. To the naked eye the appearance is normal.

Spleen. No visible change.

Lymph-glands. In most cases these are edematous. In an area where there is extensive, sero-sanguineous exudate, the lymph-glands may be greatly enlarged and the efferent vessels engorged with amber-colored lymph.

Diaphragm. Extensive hemorrhages are usually present.

Lungs. Small hemorrhages often occur in the parenchyma and under the pleura.

Heart. In every case ecchymoses have been observed beneath the endocardium. These are very pronounced in the left ventricle.

The anemic type. Only one case has been examined by the writer, that of a calf which died following the operation of dehorning. The superficial veins were empty. The abdominal viscera were normal save for marked edema in the wall of the abomasum and slight edema in the mesentery. Some lymph-glands were edematous. The abdominal cavity contained about 500 cc of clear fluid. There were well marked subendocardial hemorrhages. Veterinarians report that in this type of the disease the total quantity of blood is much reduced.

MORTALITY

The death-rate is always high. The figures given here represent eleven outbreaks only, as accurate data on mortality could not always be obtained. In 83 cases of the disease there were

17 recoveries, giving a death-rate of 79.4%. Most of the recoveries were among old animals.

DIFFERENTIAL DIAGNOSIS

The disease under consideration is frequently mistaken for hemorrhagic septicemia or symptomatic anthrax. Table 1 enumerates the points of difference between these somewhat similar diseases.

ANTE-MORTEM

	Disease Investigated	Blackleg	Hemorrhagic Septicemia
Local lesions (swellings)	Non-inflammatory. No gas.	Inflammatory and emphysematous.	Inflammatory and painful.
Temperature	Normal or subnormal.	Elevated.	Elevated.
Respirations.	Slightly increased.	Very rapid.	Very rapid.
General appearance.	Frequently normal till a few hours before death.	Acutely sick.	Acutely sick.
Visible mucous membranes.	Blanched.	Injected.	Injected.

POST MORTEM

Blood.	Pale and little tendency to clot.	Dark and coagulates readily.	Normal in color and coagulates.
Liver.	Shot with dark punctate hemorrhages (acute type).	No marked change.	No marked change.
Swellings.	Sero-sanguineous; the surrounding muscles pale; no odor.	Emphysematous; the muscles dirty-brown or blackish.	Sero-sanguineous; surrounding muscles normal.
Lymph-glands.	Normal or edematous.	Inflamed.	Inflamed.
Organism.	None present.	<i>Clostridium chauvei</i> .	<i>Pasteurella bovis-septica</i> .

It should be remembered that hemorrhagic septicemia and blackleg are not stable diseases but pasture diseases. The feeding of damaged sweet clover will naturally arouse suspicion.

TREATMENT

The most valuable method of controlling the hemorrhage when the ordinary mechanical means cannot be employed is the injection of freshly drawn blood-serum. The animals should be given plenty of water and a laxative diet such as bran mash. It is of great importance to keep the animals quiet, as anything that causes excitement increases blood pressure and tends to facilitate hemorrhage.

PREDISPOSING CAUSES.

Age. Young animals are highly susceptible while the aged are markedly immune. This is well demonstrated in the Beeton outbreak. The animals were receiving damaged ensilage in quantities proportionate to their body weight. (Table 2).

TABLE 2.

Age	Total Number	Deaths
Between 6 months and 1 year.....	5	3
Between 1 year and 2 years.....	31	16
Over 2 years.....	22	0

In one case a calf was born which, within a few hours after birth, developed typical symptoms and died, while the mother remained well. In another case an aborted calf showed well marked lesions, the mother remaining perfectly healthy.

Obesity. The remark that "the best animals in the herd have died" was commonly made by the owners. This can most likely be accounted for by the fact that the fattest animals were the heartiest feeders and best assimilators.

Unusual exertion. There is quite a little evidence that excitement and severe exertion help to precipitate the disease.

SUSCEPTIBLE ANIMALS

Information on this point is at present very limited. Cattle are highly susceptible. Paulman¹ reports losses among sheep and a fatal case in a horse. The latter animal has considerable resistance, no cases having occurred in the outbreaks observed by the writer. Rabbits are very susceptible.

SOME UNUSUAL MANIFESTATIONS OF THE DISEASE

Apart from the typical forms of the disease already described, damaged sweet clover has been responsible for several cases of persistent and fatal post-partum hemorrhage, abortion and extensive edema. Hemorrhage into the eye has caused blindness, and cerebral hemorrhage paralysis.

ETIOLOGY

There is no longer any doubt in the minds of those who have had experience with this disease that it is always associated with the feeding of sweet clover. The point of dispute is the way in which sweet clover is responsible for the disease. In considering this problem, at least three possible ways suggest themselves. They will be briefly considered.

(A)—*Is sweet clover injurious because of a poisonous principle in the plant?*

In his book on poisonous plants Pammel² makes the following statement in regard to the sweet clovers:

"The sweet clovers contain the substance curmarin C_9H_6O , which is found in the tonka bean, sweet vernal grass, vanilla grass, etc. In Europe the sweet clover is suspected of being poisonous. Some years ago the writer conducted an experiment in feeding considerable quantities of sweet clover, but without any injurious symptoms resulting. According to Freidberger and Frohner, sweet clover causes paralysis of the muscles."

Although suggesting its poisonous nature, Pammel gives no proof, he merely cites opinions. Numerous experiments of the writer all indicate the harmless nature of the plant. Calves and rabbits have been fed on an almost exclusive diet of good hay and sound ensilage over a period of many weeks with no ill effects. One must also take into consideration the fact that thousands of farmers have been feeding sweet clover to their stock for many years with only occasional and localized outbreaks. There is the possibility that only at a certain stage of maturity does the plant become poisonous, or that only certain species are poisonous. Experimental work has practically eliminated these possibilities. The reasonable conclusion is that sweet clover can not be considered as a poisonous plant.

(B)—*Is sweet clover injurious because of a deficiency in some essential food element?*

A chemical analysis of sweet clover shows that it contains carbohydrates, proteins, fat and ash in sufficient quantities to satisfy the requirements of the body tissues. It would appear to be a well balanced food, and not likely to cause such acute conditions as are seen in this disease. Again, the verdict of the majority of those who feed sweet clover is that it is an excellent food for stock. If this were a deficiency disease, then the worst cases ought theoretically to occur among animals which were receiving an exclusive diet of sweet clover. This has not proved to be the case. The worst outbreak was among cattle receiving only a limited amount of sweet clover, while a liberal quantity of grain and hay was included in the ration.

The evidence is entirely against the idea of a deficiency disease.

(C)—*Is sweet clover harmful because of poisonous products formed in it by micro-organisms?*

In every outbreak investigated, as well as in the majority of reported cases, the sweet clover was found to be mouldy. A denial of the existence of mould was generally due to the fact

that the mould was concealed within the hollow stalks and thus not immediately visible. It can be said emphatically that the disease is produced not by good, but only by damaged clover. The presence of moulds is absolute evidence that at one time the sweet clover was a suitable medium for the growth of micro-organisms. The large colonies of mould are easily seen by the naked eye, while the small colonies of bacteria which are undoubtedly present escape observation. Whether the moulds or the bacteria were the ultimate etiological factor was an interesting problem to be settled.

The fact that moulds and bacteria have been growing in the plant tissues brings with it the possibility of the production of poisons, either directly as a specific secretion of the organisms or indirectly due to a splitting of the clover protein. The plant, being a legume, contains a large quantity of easily convertible protein (globulin) which is a real source of danger when infected with proteolytic organisms.

A very simple, yet very significant, experiment may be mentioned to advantage at this juncture. Good clover stalks and damaged clover stalks were hand-picked from the same hay mow. The good were fed to one rabbit and the damaged to another. The rabbit which ate the good remained well, while the rabbit which ate the bad died, showing typical lesions. This experiment was duplicated, using a different sample of clover hay. The results were the same.

In determining the cause of the disease the available evidence points to a toxic substance, developed by the activities of micro-organisms, growing in the sweet clover, as the responsible factor.

THE ETIOLOGICAL SIGNIFICANCE OF THE MOULDS

Mouldy food, for a long time, has been recognized as a common cause for sickness among animals, but the writer is not familiar with any instances where the moulds have been isolated, cultured, and used successfully in reproducing the disease. When food containing mould is condemned as the cause of disease, it is not because of any precise knowledge as to the pathogenicity of the moulds, but experience has frequently shown that mouldy food will kill animals. The mould is a very useful danger signal. It may or may not be of real danger itself, but it is a certain indicator of danger.

THE DISTRIBUTION OF THE MOULDS IN THE CLOVER

Most of the samples of damaged hay examined have shown

the presence of a dark mould growing both without and within the clover stem. Associated with this mould is a yellow variety found almost exclusively within the stem and easily overlooked unless its presence is expected. The quantity of mould visible on the exterior of the stalks may be very trifling, consequently the existence of mould in the hay is not infrequently denied by the inexperienced observer. The stalks which contain mould in their hollow centers usually have a dull appearance on the outside. The colonies of mould within the stalks are generally found opposite a place where the stem has been injured. The mould probably commences to develop on the outside of the stalks while the hay is in the coil. As the outside becomes dry the mycelia penetrate towards the centre and there continue to grow till the stalk becomes desiccated.

All mouldy sweet clover hay is not poisonous, the toxicity depending upon the species of infecting mould and possibly upon the species of the clover.

An investigation of the moulds rather than the bacteria was undertaken for two chief reasons: (a) The disease occurred in connection with ensilage that was mouldy, never with well ripened ensilage, although the latter is teeming with a variety of bacteria some of which are capable of altering the clover proteins. (b) There was a greater constancy among the species of moulds found in different samples of damaged clover than in the bacterial flora.

METHODS OF ISOLATION AND CULTIVATION

After many trials the following has been adopted as the most satisfactory method for aerobic isolation. Fine clover stalks are cut into half-inch lengths and spread in a single layer over the surface of an enamel dish, such as is used for plate development in photography. A larger dish covers the smaller, as in the petri dish. The stalks are soaked in water to facilitate cutting. A small quantity of 2% agar is poured into the dish, almost sufficient to cover the clover stalks. This mixture of stalks and agar is sterilized and when solidified is ready for use. Surface inoculations are made and dilutions from dish to dish in exactly the same way as in the isolation of bacteria by the surface-streak, plate-dilution method.

Media made in this way is superior to sweet-clover-extract agar and is much more easily prepared. Glucose can be added to advantage. Due to the acidity few bacteria develop on this

media. The ordinary petri dish is far too small for the isolation of moulds, as the colonies rapidly coalesce.

Pure cultures can be maintained on potato media or sweet-clover-extract agar. By this method a number of different species of moulds have been isolated. The majority belong to the aspergillus variety. While these moulds can be readily detected by the difference in color, care must be exercised in differentiating, as the same species will vary greatly according to age and the nature of the medium upon which it is growing.

Several of the most prevalent species have been grown on clover stalks in pure culture and fed to rabbits with most interesting results. To grow in large quantities the mould is cultivated on clover stalks in glass flasks. It is important that the stalks should contain a suitable quantity of moisture in order to get a good growth. When either too moist or too dry the growth is very poor.

ANIMAL EXPERIMENTS WITH PURE CULTURE OF MOULDS

During the early days of the investigation it was discovered that rabbits were quite susceptible to poisoning when fed on mouldy sweet clover. They came down with both types of the disease. The fact that rabbits can be used in this way has greatly facilitated the work of testing out different strains of moulds and also in demonstrating to the unbelieving the effect of damaged sweet clover. Numerous experiments would indicate that good sweet clover, either in the form of hay or ensilage, is quite harmless to rabbits.

Experiment A—To determine the pathogenicity of isolated strains. Heavy cultures of the mould to be tested were prepared. The mouldy stalks were cut into small pieces, mixed with shorts and bran, and fed to the experiment rabbits. This was given twice daily with a small quantity of meadow hay and all the water they required. Some rabbits absolutely refused to eat the ration while others ate heartily. Quite a few rabbits died after the first few meals. The post-mortem examination revealed nothing of significance. Controls were fed a similar quantity of good clover stalks which had been autoclaved. Six different varieties of mould have been tested out on rabbits. Of these, two seemed to be quite harmless, while one produced a well-marked edema of the ear, and the other three all produced alterations in the blood or blood vessels.

One variety—an aspergillus—which has been isolated several times from mouldy clover hay, produces a disease in rabbits which very closely resembles the disease as it occurs naturally in cattle. Nine rabbits have been fed on this particular strain—aspergillus A—and in all cases except one there has been a marked increase in the clotting-time of the blood, followed in a few days by hemorrhage and death. The alteration in the coagulation time usually occurs between the fifth and the eighth days, the time required for clotting being increased from ten minutes to as much as one hour and a half. In fatal cases the blood may finally lose its power of coagulation.

The production of hemorrhage was generally facilitated by placing the rabbits in the warm incubator (37°C.) for half an hour and thus raising the blood pressure. In the case of cattle, pressure and strain on the weakened blood vessels frequently occur—for example when the animal arises from the stable floor, while in the case of a light animal living in a cage this does not take place to any great extent. Strain D. B., a penicillium, produced a fifty per cent destruction of the red blood cells, but only a slight alteration in the clotting time. Strain D. W., a mucor, had a similar but less effect to the one previously mentioned.

It was thought that a combination of these different moulds would reproduce more perfectly the disease than the use of any single strain. Damaged hay always contains several varieties of mould and the different manifestations of the disease which occur in cattle can most likely be accounted for by the kind of moulds present in the damaged hay or ensilage. In a recent experiment two varieties of mould were used in inoculating the clover stalks, and by accident a short bacillus, which is commonly found in the mouldy hay, also entered the mixture. A good growth was obtained and when this was fed to a rabbit a most typical case of the hemorrhagic type was produced. Table 3 gives a brief summary of this experiment.

TABLE 3.

Date	Hemoglobin %	Clotting-time	Note
August 15	80	5 min.	Began to feed
August 21	40	30 min.	
August 22	30	1 hr.	
August 23	8	Fails to clot	Killed

The post mortem showed extensive hemorrhage in the muscular portion of the diaphragm, into the abdominal muscles, with many smaller hemorrhages in the intercostal spaces and internal to the scapulae. The blood showed few platelets, many young red blood cells, and some normoblasts. It had entirely lost its clotting power but coagulated readily when fresh serum was added.

Experiment B—To determine whether other closely related legumes may become similarly toxic when they become mouldy. A heavy growth of a toxic mould, strain A, was obtained on red clover, alfalfa, and timothy hay respectively. When fed to rabbits over a long period of time no ill effects were produced, except in one of the rabbits receiving the alfalfa which died on the fourteenth day. Nothing definite could be found at the post mortem. Tests ought to be made with other species of moulds and bacteria.

Experiment C—To determine whether the different varieties of sweet clover are all and equally poisonous when mouldy. At present a report can be made on two varieties only. The white biennial has been found to be poisonous both when cut in early blossom and late blossom. The white annual, cut at time of budding, proved to be highly toxic. This refers to mouldy clover only. It was impossible by this method to determine the comparative toxicity of the different clovers due to the great variation in the appetites of the experiment rabbits. There is no doubt in the mind of the writer as to the ability of certain moulds to alter sweet clover, changing a harmless substance into something highly toxic, which is capable of producing in rabbits a disease practically identical with that which occurs in cattle.

An objectionable feature is the frequent necessity of feeding larger quantities of mouldy culture than is required to produce the disease when the naturally moulded hay is used, and the need of artificially raising blood pressure by means of the incubator.

The mould, apart from sweet clover, is apparently not poisonous except for very young animals. This was evidenced by a number of experiments in which massive doses of moulds cultured on potato were fed to rabbits without producing any typical symptoms. Some of the younger rabbits died after the first few meals. As in other experiments nothing definite could be found on post mortem in these young animals. Practically nothing

can be reported as to the effect of bacteria upon sweet clover. One culture alone has been thoroughly tried out, with negative results.

PATHOLOGY

Morbid histology. The findings recorded here are based upon the microscopical examination of tissues obtained from six cases of the acute type and one of the subacute type of this disease. Although the number of cases studied was not large, they were typical, and the nature of the lesions so constant that some definite statements with regard to the tissue changes can be made with certainty.

Liver. Under the low power the sections have a characteristic, blotchy appearance due to the alternation of normal and lightly stained, with degenerate and darkly stained areas. The cells surrounding the central vein have frequently undergone necrosis. They have lost their nuclei, appear swollen and homogeneous, and stain deeply with eosin. Whole lobules may be affected in this way. The cells at the periphery of the lobule are generally normal. The necrotic cells may be found in any part of the lobule. Between the outer, healthy cells and the innermost, dead cells are a few rows of damaged cells which take up the eosin readily and contain pyknotic nuclei.

Small and large hemorrhages occur with frequency. These are seen not only in the most damaged areas around the central vein but appear anywhere in the lobule. In one specimen there appeared to be evidence of destruction of the wall of a portal vein causing a hemorrhage into the surrounding tissue. There is an increase in the number of lymphocytes and leucocytes in the capillaries, but there is no evidence of infiltration around the necrosed areas. There is nothing indicative of inflammation. No fat was found in the acute cases, but in one chronic case there was some fatty degeneration around the central veins. This case, as well as one of the subacute type, showed a great many areas of hydropic degeneration.

Kidney. This showed evidence of nephrosis. It may be very acute, so that the cells lining the tubules have been destroyed and are desquamating, or of a milder type, with the epithelial cells granular, slightly swollen, and the nuclei of some pyknotic. Large globules having a hyaline appearance were frequently observed. Many of the tubules were filled with casts. There were a few small hemorrhages in the cortex. While there was

an intracapillary increase in the number of white blood cells there was no evidence of a leucocytosis or round-cell infiltration.

Spleen. The dehorned calf, which is considered as a subacute case, showed a large quantity of pigment. This was also found in the spleen of the acute anemic cases which occurred in the rabbits. The red blood cells took up the eosin very poorly.

Lymph-glands. Sectioned in two cases only. In the one the gland was normal and in the other markedly edematous. This latter condition was easily seen by the naked eye. Under the microscope the sinuses were found to be distended with lymph and there were several small hemorrhages.

Intestines. Sections from the intestines showed small and large hemorrhages. These were usually in the subperitoneal connective tissue, but may be either submucous or intramuscular. There was no evidence of inflammation.

Heart. This organ showed some degeneration of the muscle fibres of the outer fasciculi in the muscular pillars. Scattered here and there throughout the heart muscle were bundles of degenerate fibres. In two cases there was a definite infiltration with round cells and polymorphonuclear leucocytes around the damaged muscle fibres. Small hemorrhages were common between the muscular bundles. In all cases there was an extensive hemorrhage beneath the endocardium, covering the muscular pillars of the left ventricle.

Lungs. Showed no constant changes. In one instance there was well marked edema involving a few lobules. The alveoli were full of fluid and the capillaries engorged but there was no evidence of diapedesis or hemorrhage.

SOME NOTES ON THE PATHOLOGY OF THE BLOOD

A prolonged coagulation time and a low percentage of hemoglobin are two conditions frequently observed in connection with this disease whether experimental or natural. The acute form of the disease can occur without either of these changes, but in the subacute form it is most likely that both are always present to some extent.

As to the altered coaguability, with our limited knowledge of the intricate mechanism which is involved in the process of clotting, it is frequently impossible to determine with accuracy the reason for failure or delay in this common phenomenon.

To find out whether the delayed clotting time was due to the absence or inhibition of thrombin, a small quantity (.05 cc) of

fresh, human blood-serum was added to 1.5 cc of anemic blood which had lost the property of coagulation. Clotting began in less than a minute and was complete in four minutes. The addition of calcium chloride failed to bring about clotting.

It was thus discovered that the inability of the blood to clot was not due to a deficiency in calcium salts or fibrinogen, but due either to an absence of thrombin or an inhibition of thrombin. It is difficult to state which, as the blood contained platelets, though in reduced numbers. It is interesting to note that certain protein split-products—the proteoses, for instance—have the power of stimulating the liver to produce anti-thrombin. It is possible that such proteoses are formed in the mouldy clover, and that they indirectly are responsible for the altered clotting-time of the blood.

The low percentage of hemoglobin (readings as low as 10% to 20% of hemoglobin which occur in the experimental anemia of rabbits) is due to two causes: (a) a tremendous destruction of erythrocytes and (b) hemorrhage.

Intra-vital staining. When the blood from cases showing a low percentage of hemoglobin is stained with a 1% aqueous solution of crystal violet a great many reticulated erythrocytes can be seen. This would indicate that the bone marrow is doing all in its power to replace the erythrocytes which are being destroyed in the blood stream. The rapid recovery of the experimental cases gives further proof of the ability of the erythroblasts to repair the loss of cells, if the feeding of the toxic substance is discontinued. Normoblasts are not seen so frequently as would be expected.

WHAT IS THE MECHANISM BY WHICH THE DISEASE IS PRODUCED?

The answer to this interesting question must at present be speculative, yet it can be reasonable, if constructed upon the data obtained from the clinical and pathological study of the disease. One type of the disease is characterized by hemorrhage and the other type by anemia. It is not a contagious disease and nowhere gives evidence of inflammatory reactions. All cases of the disease show damage or destruction among the cells of the vital organs. These conditions, taken in conjunction with the fact that cases showing symptoms of acute toxemia have occurred, warrant the supposition that a powerful poison is most likely developed in the clover by microbial activity.

The massive hemorrhages most likely result from a rupture in a small arteriole, while the petechiae and ecchymoses can be explained by the same condition occurring in the small capillaries. A poison which is sufficiently powerful to destroy all the cells of a liver lobule surely possesses the possibility of causing degeneration in the walls of blood vessels and capillary endothelium. The theory that the hemorrhage is the result of the delayed clotting-time of the blood is not sound, and can be disproved by certain clinical cases.

The edema can be accounted for by a toxic paralysis of both the blood and lymph capillaries.

The destruction of the red blood cells, the necrosis of the liver cells, the marked nephrosis, and other changes can be explained only by postulating the presence of a poison circulating through the animal body, attacking and sometimes destroying the most vulnerable cells and tissues.

IMMUNITY

No work has been done in this direction, therefore no definite statements can be made. Circumstantial evidence would point against the development of immunity. In several instances sweet clover has been fed to stock with fatal results. The sweet clover has then been removed from the ration for a period of several weeks. With renewed feeding of even smaller quantities the disease has recurred. To the writer this suggests a lack of immunity.

MISCELLANEOUS EXPERIMENTS

Under this heading are grouped a number of experiments, all bearing upon the question of sweet clover and its relation to disease. Lack of space demands that the briefest summary possible be given.

Experiment A-1—To determine whether mouldy sweet clover is or is not harmful when fed to cattle.

Three calves were fed on timothy hay, good ensilage, and mouldy ensilage respectively. The feeding was continued for twenty-one days, when all were castrated. The calves receiving the timothy hay and the good ensilage remained well while the calf on mouldy ensilage died from hemorrhage several hours after the operation.

Experiment B-1—To determine the changes produced in the blood by the feeding of mouldy ensilage.

Two calves were employed. One was fed good timothy hay

and the other mouldy ensilage. The average clotting-time of the calf on mouldy ensilage was $28\frac{1}{2}$ minutes. The average time of the calf on hay was $11\frac{1}{2}$ minutes. Both were dehorned and the calf on ensilage died of hemorrhage three hours after the operation. The calf on the good hay remained well.

Experiment B-2—Six rabbits were fed on aqueous extracts of mouldy sweet clover. Three became acutely sick and three remained well. The latter were all old rabbits. In those which were affected there was an incubation period which averaged nine days. A very acute anemia was produced, fifty per cent of the red blood cells being destroyed in less than one week. The rabbits rapidly recovered when the extract was withheld. The clotting-time was also delayed. No immunity was developed, the disease reappearing when the extract was again fed.

Experiment C-1—To determine whether the mouldy stalks are more poisonous than the non-mouldy stalks in a sample of disease-producing, sweet-clover hay.

Six rabbits were used and three different samples of mouldy hay. The clean stalks were carefully separated from the mouldy stalks in each sample, and one rabbit was given the good and the other the bad. The three rabbits which ate the mouldy stalks died while the rabbits which ate the clean stalks remained well. (N.B.—This experiment would strongly discredit the idea of any natural poisonous principle being responsible for the disease.)

Experiment F-1—To determine whether good, sweet-clover ensilage, if fed in large quantities, may become harmful.

Four calves were used in the test. Two were fed exclusively on ensilage with a little bran, half a pound per day. The other two were given less ensilage and some timothy hay with the same quantity of bran. Two different samples of ensilage were used. The test was continued for five weeks during which time frequent tests were made. The animals remained normal and were successfully dehorned at the close of the experiment.

THE DIAGNOSIS VALUE OF HEMOGLOBIN AND COAGULATION-TIME ESTIMATION OF THE BLOOD

The following was the method employed in estimating the coagulation-time of the blood. A large-gauge needle was thrust into the compressed jugular vein and the blood caught in a test tube with a definite diameter of one-half inch. The blood was collected to a depth of about two inches in the test tube. When

the blood did not flow freely through the needle a new needle was employed and a fresh attempt made. The test tube was then placed in a pan of water at 37°C. The clotting first occurs on the surface of the tube where the blood and air meet. The tube is occasionally tilted and when the whole of the blood has formed a solid coagulum, coagulation is considered complete and the time required recorded. With this technique the coagulation time for a normal cow varies from five to fifteen minutes. Errors can very easily be made. The test tubes and needles must be absolutely clean and the blood obtained from the vein without any delay.

The method of drawing the blood from the vein into a syringe and then transferring to a test tube is not so reliable as the direct flow into the test tube. (See table 4).

TABLE 4.

No.	Pulse	Clotting-time	Hemoglobin %
1	78	6 minutes	100
2	78	20 minutes	68
3	108	10 minutes	110
4	78	30 minutes	85
5	72	22 minutes	100
6	78	20 minutes	97
7	86	47 minutes	90
8	..	22 minutes	97
9	78	15 minutes	78
10	66	18 minutes	95
11	78	43 minutes	60
Calf (normal)	..	5 minutes	

At the time of testing this herd the animals were still receiving sweet clover in their rations and during the preceding few days six animals had died. It will be noticed that nos. 4, 7 and 11 gave a very much delayed clotting time. Animal no. 4 looked well and remained so. Animal no. 7 was not eating well and looked a little sick. Her pulse was fast. Animal no. 11 was a clinical case showing a diffuse swelling which extended down the left thigh. This could be seen only on careful observation. The percentage of hemoglobin is low in this case. Animal no. 3 proved to be of interest. This cow was apparently quite well at the time the test was made but was regarded with suspicion because of the high pulse rate. On the day following the test she suffered from a severe hemorrhage, but made a complete recovery. In all cases the pulse was accelerated and the animals seemed nervous.

The outbreak had been considered as probably hemorrhagic septicemia and while the stable had been thoroughly disinfected and the carcasses carefully removed, the feeding of sweet clover was continued. The farmer, who was a very careful man, denied that the clover hay was musty. A careful examination of the stalks revealed many that had colonies of mould within the hollow stems.

PROPHYLAXIS

The preventive measures suggested are based upon a belief that the disease is due to poisons produced by the growth of moulds and possibly other micro-organisms in the sweet clover. Whether moulds alone are responsible is a matter of little consequence from the standpoint of prophylaxis; they are always a danger signal. It is therefore a question of how best to prevent the development of these organisms. In the first place it must be borne in mind that the most important factors in the development of mould and bacteria are climatic, and thus outside the control of man. When the season is wet the hay is almost sure to be mouldy. The following practical suggestions are offered:

1. Sow only scarified seed, and sow heavily, not less than twenty pounds to the acre. This will insure a heavy stand, and the stalks will be thin. Moulds develop most readily on tough woody stalks.
2. The clover should be cut early, the most suitable time being when the crop is in bud.
3. Cure the hay in large coils and never draw in to the mow when wet. Mould will grow luxuriously on stalks that have been thoroughly dried if these later become wet.
4. Salt added to the clover at the time of stacking, in the proportion of about fifty pounds to the ton, seems to be very beneficial.
5. The hay must be protected from moisture which, during the winter months, may rise from the cow stable and condense on the fodder in the hay mow. This is very important.
6. In the case of ensilage, mould will not develop if the sweet clover is free from woody fibre, ensiled as soon as cut, cut short and thoroughly tramped in the silo. Exclusion of air in the silo means freedom from mould, and freedom from mould means freedom from disease. In every outbreak among cattle, where ensilage was being fed, the latter was coarse and dry, which had made close packing in the silo impossible.
7. If there is any evidence of mould the hay should be fed sparingly, and only to mature cattle and horses.

The making of hay from sweet clover is attended with real danger. No other hay crop becomes so definitely poisonous to stock when harvested under unsuitable conditions.

CONCLUSIONS

1. That the disease investigated is a new disease, and, while simulating hemorrhagic septicemia and blackleg, is entirely distinct from these diseases.

2. That the disease is produced by a toxic substance which is present in mouldy sweet clover. There is much evidence that certain moulds are responsible for the formation of this poisonous principle.

3. That the toxic substance produces the disease by destroying or damaging the cells of important tissues and vital organs. This may result in hemorrhage, delayed coagulation of the blood, and destruction of the red blood cells.

4. That there is no evidence to show that the feeding of good, sweet-clover hay or ensilage can produce the disease in question.

5. That the moulding of the hay and ensilage can be greatly reduced by observing proper methods of sowing and harvesting the crop.

ACKNOWLEDGMENTS

The writer wishes to express his appreciation to Dr. C. D. McGilvray, Principal of the Ontario Veterinary College, for his reading and helpful criticism of the manuscript of the report; also to Drs. H. E. Batt, R. Gwatkin and R. A. McIntosh, of the Ontario Veterinary College, for their frequent assistance in carrying on the laboratory and experimental work; and to Dr. L. H. Robinson, Pathologist at the Toronto General Hospital, for his valuable aid in interpreting the microscopical sections.

REFERENCES

- ¹Paulman, V. C.: *Veterinary Medicine*, xviii (8).
²Pammel, L. H.: *Manual of Poisonous Plants*, p. 552.

DISCUSSION

DR. E. A. WATSON: Mr. Chairman, I think Dr. Schofield has made a very able presentation of a very difficult subject. Sweet-clover poisoning, judging from the manner of its occurrence and manifestations opens up a number of viewpoints which apply, I think, not only to sweet-clover poisoning but to various plant and forage poisonings and intoxications. A point of much importance, and that needs emphasis, I think, is the epidemiology of these diseases. Dr. Schofield mentioned the common or universal prevalence of sweet clover but that the disease is met with only, as far as we know, in certain areas—an observation which seems to hold good with a number of so-called plant poisons, such as, for example, bracken poisoning, loco disease, and others. We know that on the eastern slope of the Rockies loco disease exists, and the loco plant is generally considered as the cause of the disease or as being associated with it, and yet when we come further up the range into the eastern slopes in Canada we have loco disease but we cannot produce the disease by feeding the loco plant, while down in Colorado they can.

It seems to me if one of these problems is solved in its entirety, that we may have a solution ready for some of the other different forms of plant poisoning which are so puzzling. We are too apt to attribute the disease to the plant itself, whereas there is a great possibility, if not a probability, that it is some organism or pathogenic fungus associated with the plant that produces the disease in the animal eating it.

I would like to ask one question of Dr. Schofield in regard to temperature. Dr. Schofield said, I believe, that a very important point in diagnosing the disease is that there will be no temperature. I would like to know clearly if

that was his experience in the animals in which the disease was experimentally produced. I have followed with some interest the discussion in England on bracken poisoning, in which Stockman and others have found a high temperature at the beginning of the disease.

When one goes into the field to see some of these cases, it is usually a day or two before the animal is dying and the temperature then may be normal or subnormal; but I would like to know if in the experimental cases which have been observed from the very beginning, and during the incubation stage, as it were, if the temperature is normal or subnormal from the very beginning?

DR. A. E. CAMERON: Mr. Chairman, may I ask Dr. Schofield what is meant by "scarifying" seed and why the process is carried out?

DR. JAMES BROWN: May I ask Dr. Schofield how he explains the lesions found in the calf born of a cow in which there was no evidence of the disease?

DR. J. DUNN: Dr. Schofield, in the experience with sheep did you have the same marked hemorrhages that you had in the other animals, or did they show any lesions or any trouble on sweet-clover pastures? I have found in my locality, where we have quite a lot of poisoning in sheep, though no post-mortems on them have been made, that by taking them off the pastures we had no more fatalities.

CHAIRMAN REED: We have so many different troubles apparently due to forage, that there must be other interesting cases that might be brought up in this connection.

In my own state we have a trouble rather difficult to explain, which is due to a summer grass commonly called "crab-grass," which under certain conditions seems to cause serious trouble with cattle and occasionally with horses. The disease always seems to be caused by the grass when it is affected with a mould. Just what this mould is, I do not know. In the case of this grass, we cannot trace the trouble to injury to the plant itself. The grass grows very near to the ground and of course is susceptible to various moulds. The trouble is quite general in our section, and I was wondering if we couldn't very properly study it from somewhat the same standpoint that Dr. Schofield has studied his sweet-clover trouble.

Has any one else any questions?

DR. E. A. BRUCE: As our Chairman has branched off a little bit, perhaps from the immediate subject, I thought I might mention something in connection with a mould that was concerned in an outbreak with which I had to do some years ago. In British Columbia, in an outbreak that eventually was diagnosed as being coccidiosis in cattle, we found, in this particular outbreak where one hundred cattle had died with intense dysentery, particularly in the abomasum, a mould that was growing all through the tissues, of a very characteristic shape, very much like a policeman's baton, one on top of the other. At the time, I had not, as a matter of fact, found coccidiosis in these cattle, as they were not mature animals, and we find in them it is very largely confined to the rectum.

In so far as the mould itself is concerned, I sent some of these specimens to a plant pathologist to have him look them over—a man who has quite a reputation on this side of the line. I was not able to see him personally when I went to his office and I left the slides for him. He came up to see me some time afterwards and he was unable to find anything on these slides, but as soon as the fields were picked out for him, he could see them quite plainly, showing that the plant pathologist, when put up against animal tissues, is apparently completely at sea.

We were unable to get anything out of that, but the interesting feature is that in these animals in which the mortality was very great, there is no question that the injury to the system through the coccidiosis was the primary cause. This stock was eventually sold to some Indians, at a very low cost, and, much to the disgust of the owner, with no ill effects.

DR. CHARLES S. CHASE: The question of the feeding of ensilage is one which has been a source of great disappointment by reason of our suffering considerable losses from time to time due to the ingestion of different moulds—the blue, the green and the pink moulds—and great losses have occurred along those lines. I would like to ask the essayist if in his work with the moulds on

the sweet clover he has found any specific remedies that will be efficacious in the treatment of the cases?

DR. SCHOFIELD: With regard to Dr. Watson's question, relative to temperature, when I stated that temperature does not occur in these animals, Dr. Watson, I meant that it did not occur in the clinical cases as far as we know. I have not taken any temperatures at all on experimental cases, and the reports I have received from veterinarians generally are that temperature does not occur. In the outbreaks that I have visited, I have always taken temperatures, because at first I thought that it was a most important thing to do, and I have seen well advanced cases with no temperature and early cases showing no temperature. That does not entirely answer your question. However, I could not tell you now just how many temperatures have been taken, but they have always been taken on the entire herd. We take temperatures on every animal in the barn. Neither the late cases nor the early cases—cases that went on to recovery or cases that went on to die—have been found to have any temperature; but that does not again, of course, exclude the possibility of there being a temperature at some time in the disease.

With regard to scarification of seed, it is found that in sweet clover, if the seed is planted without the outer, dense shell being scratched, scarified or injured, it frequently will not germinate. It might be of interest to Dr. Cameron to know that in the case of the bot-fly you have to have a certain amount of scarification of the egg before you can get the little beggar out, I believe, and it struck me the two things had something in common. The sweet clover is put into a machine and the seed is scarified. If the seed is not scarified, only about fifty per cent will germinate. There is a great difference between the seed which is scarified or scratched and the seed which is not. Therefore, if you have sown twenty-five pounds of unscarified seed, you will get a poor plant; the stalk will come up thick, and the tendency to mould is very great.

As to Dr. Brown's question, How did the calf get the disease when the mother was all right? I thought Dr. Brown would ask a question like that. In that connection I should like to suggest that when my answer proves a failure, we call upon Dr. Brown, Mr. Chairman, to give a reply. (Laughter). I would suggest this: That the calf possesses the younger tissue of the two; a tissue which has been rapidly produced—and we know that is the kind of tissue which is highly susceptible to this toxic substance.

In doing post mortems, it was found that some of the animals had warbles in the skin of the back. Around the warble, there was almost always hemorrhage. That was of interest to me and I attributed it to this, although I may be entirely wrong: That around in that location we had young granulation tissue, practically; new blood vessels were there; young tissue was there. Therefore, that accounted for the frequency of the hemorrhage around the warble. I don't say that entirely covers the case, but there it is. I have seen two cases.

In another case the calf had been aborted. When the calf was opened up, there was hemorrhage everywhere around the fetus. The mother was all right. That is the only explanation I have to offer. In the calf—the yearling or two-year-old—we find a high degree of susceptibility and also in rabbits of that age. You have a hard time producing the disease in older rabbits, whereas young rabbits go down with it readily. It is the young tissue which is most highly susceptible.

With regard to sheep, I have never seen any cases in sheep. I quoted that from Dr. Paulman and he did not state anything definite with regard to the hemorrhage in sheep.

With regard to cases coming down on pasture, that is an interesting thing. People say, "But this disease has occurred on pasture." I have not yet seen the disease produced when animals were eating it out on the field, but we must remember this: There is a possibility of it occurring in animals that are out in the pasture, if they are on old, sweet-clover pasture, where there are clover stalks which are old and decaying. But I think the cases of death which have frequently occurred in sweet-clover pastures have been due to deaths from

bloating. Animals bloat very quickly on sweet clover, although possibly not more so than on red clover, but that will occur.

I don't think there is anything to state with regard to your reference to crab-grass, except that I noticed the other day on a lot of the clover leaves along the roadside there were moulds growing on the clover leaves. I plucked some of them and looked at the leaves under the microscope, and could easily see the mycelial threads. There was a case in which the mould was growing on the living plant.

I am sorry I cannot say anything with regard to treatment for ordinary forage poisoning, because in the cases we have taken up, the treatment applies only to the conditions which have been produced in a peculiar type of forage poisoning, where you have hemorrhage as the cause of death. Therefore, if you can stop the hemorrhage, you can save the animal. In other cases of hemorrhage there are symptoms referring to the nervous system and the treatment is totally different. All the treatment I have suggested is simply referable to the type of disease I have been discussing. (Applause).

THE PRESIDENT'S APPOINTMENTS

In this number, we are pleased to publish President Stange's appointments of committees and resident state and provincial secretaries for 1923-1924. All of these appointees have been notified of their assignments by a personal letter from President Stange. Some of the committees and a number of the resident secretaries are already at work. The Legislative Committee has a particularly busy year ahead of it, as was shown in the preceding editorial. President Stange recently referred to the resident secretaries as our "field assistants," and, such being their status, we are going to work them to the limit. We are planning another membership drive. More later.

EXECUTIVE BOARD ELECTION

Nominations are being received for the election of a member of the Executive Board in District Number 4. It is indeed a free-for-all. At this writing the names of no less than twenty-nine members have been nominated. According to the rules, the five standing highest on the list will have their names on the election ballot to be sent out later. The polls for nominations will close on March 2, 1924. If you have not indicated your choice, do so, by all means. We have often said that our system for electing members of the Executive Board is the most democratic feature of our organization. Here is a chance to "stay at home" and vote too. Send in your ballot.

SURGERY OF THE CERVIX¹

By W. W. WILLIAMS,

Springfield, Mass.

To those who are not intimately engaged in the treatment of genital disease in the cow, surgery of the cervix usually appears as a somewhat distant and uncalled-for subject. Upon several occasions, I have demonstrated at meetings the circular amputation of this organ, and on each occasion, there seemed to be a question as to just what this operation was intended to accomplish. So, before entering into any details of surgical technique, it seems advisable to point out clearly what the indications are for such an operation. In doing this, one must have some understanding of the physiology and anatomy of this organ, know what mission it has to perform, how this mission is performed, and when in this it fails, and the reasons therefor.

Cases with which surgical treatment of the cervix is indicated are not relatively numerous, but they are so important among pure-bred cattle that the clinician should learn to recognize them promptly, and thus be in a position to insure their proper handling. He should not waste his efforts nor the money of his client by an attempt to treat a purely surgical case by other than surgical methods.

It is particularly when the infection penetrates the mucosa, becoming well established in the underlying mucous glands and musculosa, or when there is an induration of the submucosa or musculosa, that the treatment becomes a distinctly surgical problem. Surgical handling of cervicitis should be employed promptly whenever it is clear that the application of disinfectants to the part cannot yield a prompt and permanent recovery.

By operative procedure, diseased tissue is removed from the cervix, and a continuity of healthy mucous membrane is established. Its objects are two-fold: First, to bring about conception, and, second, to make pregnancy more secure.

Refractory cervical inflammations are very common, and they almost always interfere with reproduction. They may result from lacerations incurred at the time of parturition, may be secondary to severe, puerperal, uterine infection, or follow

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

service by diseased bulls, with or without any perceptible indication of physical injury. At other times, severe cervical disease occurs as the result of unskilled treatment by veterinarians or others, especially when applying the old-fashioned, cervical-dilation method, which is still, in many quarters, considered a cure for all sterility, no matter what the cause may be.

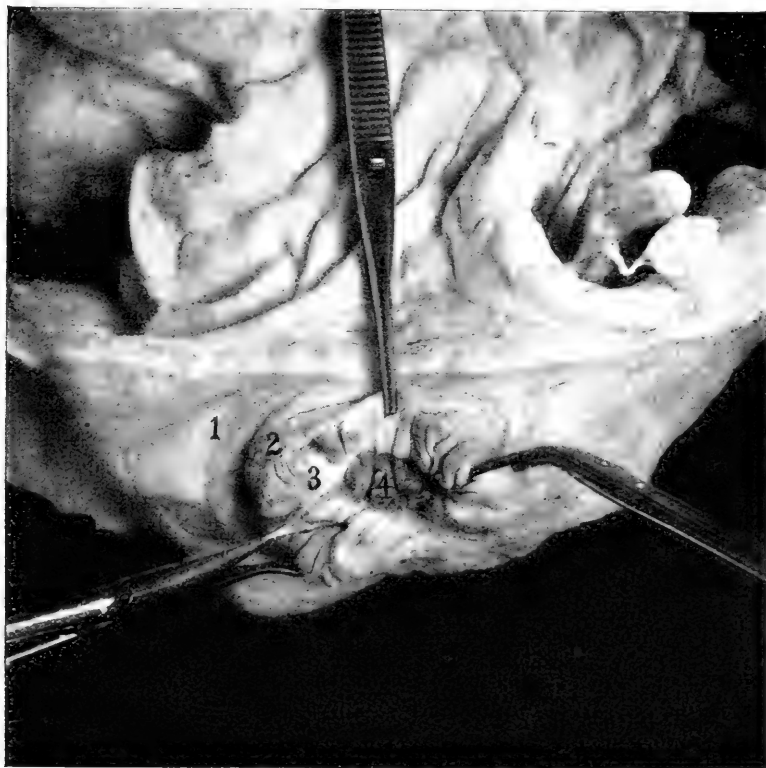


FIG. I.—Laceration of Lips of Cervix Uteri.

1, Vaginal mucosa; 2, vaginal aspect of cervical lip; 3, endocervical aspect of lip; 4, intensely inflamed first annular fold. On the right side are shown the margins of an old laceration, the posterior angles of which are held apart by the lower forceps. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

THE FUNCTIONS OF THE CERVIX

The cervix, constituting as it does the entrance to the uterine cavity, has several important functions to perform. It must first provide a free passage for the transmission of the spermatozoa forward into the uterus; then, when pregnancy occurs, form a thick mucous plug to seal the uterus hermetically, and lastly,

by means of a relaxation of its muscle fibers, allow the cervical canal to dilate sufficiently for the passage of the fetus, at the time of parturition. Its integral parts must be healthy if its function is to be normal. There should be a continuity of healthy mucous membrane lining the canal and the tissue lying under this membrane, that is, the muscular tissue should be free from infection and not indurated.

A pathologic secretion of the endocervical membrane may prevent the passage of the spermatozoa, or cause their early death. Occasionally the endocervical mucosa has been largely replaced by scar tissue. The condition is inimical to pregnancy. An inflammation or the presence of scar tissue each serves to prevent the formation of the mucous seal of pregnancy, without which pregnancy is insecure, in fact, usually aborted. Whether the seal is formed or not, the presence of a cervical inflammation or infection jeopardizes pregnancy, especially when the inflamed area extends well forward in the cervical canal, whence it apparently constitutes a constant source of contamination for the uterus.

Cervical endometritis is, as far as has yet been determined, the basic lesion in all cases which abort, and is the most prevalent lesion observed in animals with diseased genitalia. It is therefore very important that the clinician shall keep himself acquainted with the best therapeutics in the control of cervical disease. A low-grade infection allows conception more readily and thereby increases the opportunity for abortion, while a more severe form of infection makes it more difficult or impossible for the spermatozoa to migrate through the cervical canal and cause impregnation.

When impregnation does occur in the presence of an indolent cervicitis, the ovum is very frequently aborted so early that it is too small for casual detection. They are missed abortions, and are commonly referred to as sterile cows, since the only indication of abortion ordinarily presented is an increased interval between heat periods. It is thus that the question of the control of cervicitis is linked inseparably to the important phenomena, abortion and sterility, two terms which, although synonymous from a clinical and functional viewpoint, have nevertheless been brought into use in a manner such as to define as a disease entity, not a pathologic change or a pathognomonic symptom, but rather the sequelae of various pathologic changes which are common to the genital tract.

It has been unfortunate from the clinical standpoint that the common usage of these terms has been such, since the attitude thus established has led to the utter neglect of many cattle which abort. That is, the clinician has been led to believe by his colleagues in other branches of veterinary science that a cow which aborts is simply infected with abortion (whatever that may be), and thereby relieves himself of the burdens and responsibilities of clinical diagnosis and treatment, and keeps himself inexperienced or ignorant of clinical pathology.

In the virgin heifer and primipara, the annular rings are usually small and somewhat evenly placed. The cervical canal lacks the tortuousness common to multipara.

The cervix of the heifer is frequently infected and inflamed, but as a rule this is distinguishable clinically only by a slight induration of the annular folds, together with an increased rigidity of the cervix. In older animals, which have given birth to two or more calves, an inflammation usually causes more decided changes in the structure of the cervix.

For normal function of the cervix, it is apparently necessary that the mucosa of the first annular fold shall lie comparatively close to the external os. The cervical canal from the margin of the lips to the first cervical fold is normally lined with stratified squamous epithelium. At the first fold the transition is abrupt, the epithelium from this point anterior being of the columnar type. The squamous epithelium apparently does not serve so readily to conduct the spermatozoa as does the columnar type, for it is observed that when the area lined with squamous cells is greatly elongated, even in the absence of any indications of an inflammatory process, cervical sterility is common. Often, when the lips are elongated, there will be an inflammation of the first fold, it being well forward, perhaps two or three inches anterior to the lip margins. With these cases, there is rarely any beneficial result from other than surgical treatment, because, even if the inflammation subsides, the animal remains sterile until this cervical canal is shortened by the removal of the lips and the first fold.

THE PATHOLOGICAL CERVIX

The type of diseased cervix with which most veterinarians are more or less familiar is that in which an inflammation and swelling of the endocervical mucosa has caused an ectropion. The lips are pushed apart by the swelling of the mucous membrane,

and the first fold or perhaps also much of the endocervical membrane anterior to it protrudes out beyond the lips, forming an irregular, deeply creviced and angry-looking tumor. The ectropic portion may be as much as four to six inches in diameter. The degree of difficulty to be expected in obtaining impregnation is indicated by the relative accessibility of healthy endocervical mucous membrane to spermatozoa which may be deposited in the vagina.

For instance, it many times happens that when the first fold becomes ectropic, it pulls backward with it and exposes to view some healthy endocervical mucosa lining the cervical canal just anterior to the first fold. Healthy mucosa is thus brought into a position which is readily accessible to spermatozoa deposited in the vaginal cavity, although at the same time being surrounded by a fringe of ectropic tissue which may be highly inflamed. These cases often conceive readily, but the prognosis is very poor unless the inflammation has subsided and eliminated the foci of infection. Otherwise, it may ultimately be expected that the infection will permeate the tissues still further, and bring about a premature expulsion of the fetus.

When there is, along with the ectropion, an inflammation of the portion of the canal which has not become ectropic, the probability of relief by other than surgical measures is very remote. It is never safe to judge as to the health of the cervix by the appearance of the mucous membrane alone. Often a slight induration of the first annular fold or other abnormality in morphology gives the only indication of cervical disease.

The mucosa of the cervical lips is not usually involved in a cervical inflammation, excepting in the more severe cases. Occasionally an intense inflammation of the margins of the lips results from an infection of the nabothian glands, which become cystic, causing a considerable enlargement of the part. When the disease is confined to the lips, it is generally quite sufficient to lance the cysts and paint the margin of the lips and the craters of the cysts with an iodine solution. Usually the cysts will not recur. In itself, a small cyst in this region may appear of little consequence, but, looking at it from a broader angle with a general consideration of the clinical consequences which often develop from these apparently insignificant focal infections, it is apparent that these or other focal infections of the genital tract must not be overlooked.

MANY CASES TRANSITORY

By far the greatest proportion of cervical inflammations are transitory in character, being confined to a superficial, mild inflammation of the mucous membrane, especially that of the first fold. These cases require no surgery for their correction. When, however, the infection has penetrated deeply, other than surgical methods are usually of no avail. Most cases where the infection is deep-seated ultimately find their way to the butcher as incurably sterile, although they would continue, under proper therapeutics, perhaps for several years, as efficient breeding animals. When cervical disease is complicated by tubal or ovarian disease, or severe uterine changes which in themselves can interfere with reproduction, the case should be considered as inoperable. There is no benefit to be derived by operating upon a nymphomaniac.

The indications for surgery of the cervix are not so frequent that any but one devoting a large portion of his time to the treatment of genital disease will have sufficient occasion for cervical surgery to allow himself to become proficient in the technique required; but it is important that the average clinician should have a clear insight into the significance of cervical disease, be able to diagnose it and have some idea as to what treatment the case should have and what the prognosis should be.

OPERATIVE TECHNIQUE

The technique to be employed when operating upon the cervix must be decided upon by the particular merits of the case in question, but in any case, the principle involved is the removal of all diseased endocervical mucosa, together with such adjacent tissue as may be involved, establishing a continuity of healthy membrane lining the cervical canal and destroying any possible foci of infection in this region.

When the disease is confined wholly to a segment of the first fold, the base of which lies close to the os externum, with the position such that its removal will allow the preservation of the normal cervical morphology, then the operation can be limited to a simple exsection of the first fold. For this, an incision is made with a scalpel, through the mucosa at either side of the diseased fold, and the margins of the mucous membrane on the proximal side freed from the underlying tissue for a short distance, thus allowing free margins of mucosa for suturing. The scalpel is now directed into the underlying

musculosa, and by cutting first on one side of the fold and then on the other, a wedge-shaped piece is removed from the musculosa. This provides that the free margins of the mucosa may be brought together without undue strain being placed upon the sutures. The margins of the mucous membrane are sutured together either with figure-8 or interrupted sutures,

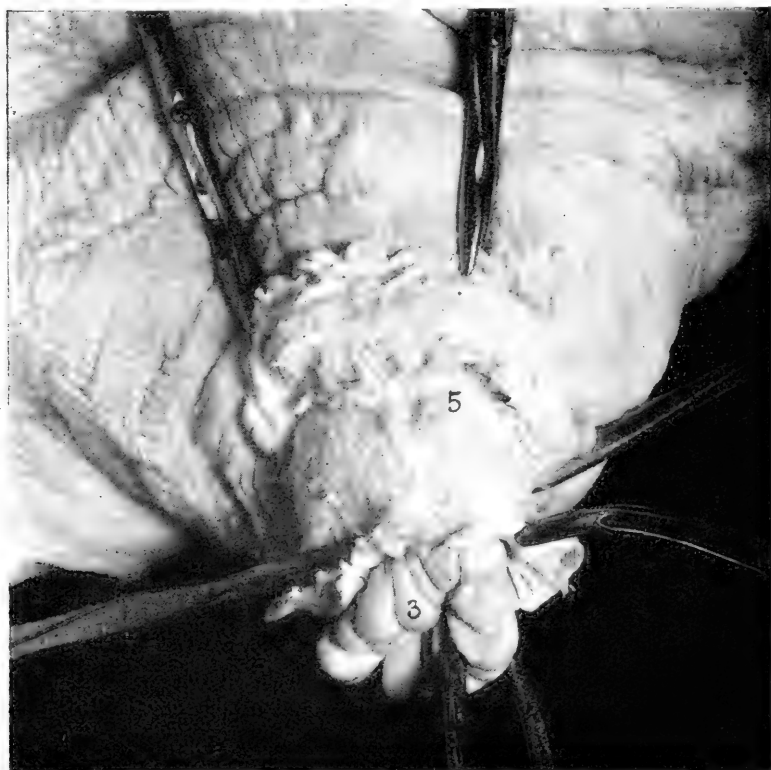


FIG. II—Circular Amputation of Cervix Uteri.

The vaginal mucosa has been dissected from and drawn forward over cervical core; 3, ectropic first annular fold; 5, exposed fibro-muscular tissue of cervical core. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

using a no. 0 or 1, 10-day, chromic catgut, and a $\frac{3}{8}$ or full-curved, $1\frac{1}{4}$ -inch, cervix needle.

In most cases, however, where surgical procedure is indicated, either the cervix is greatly elongated, necessitating a shortening of the cervical canal, or the infection has penetrated into the submucosa or musculosa, requiring that a more extensive dis-

section be made in order that all of the diseased tissue may be removed and the normal physiological relationship of the tissues re-established. This is accomplished best by a partial circular amputation of the cervix. This operation is adapted for the removal of diseased cervical tissue as far anterior as it may be desired to carry the operation and at the same time leave the remaining portion of the cervical canal absolutely free from all

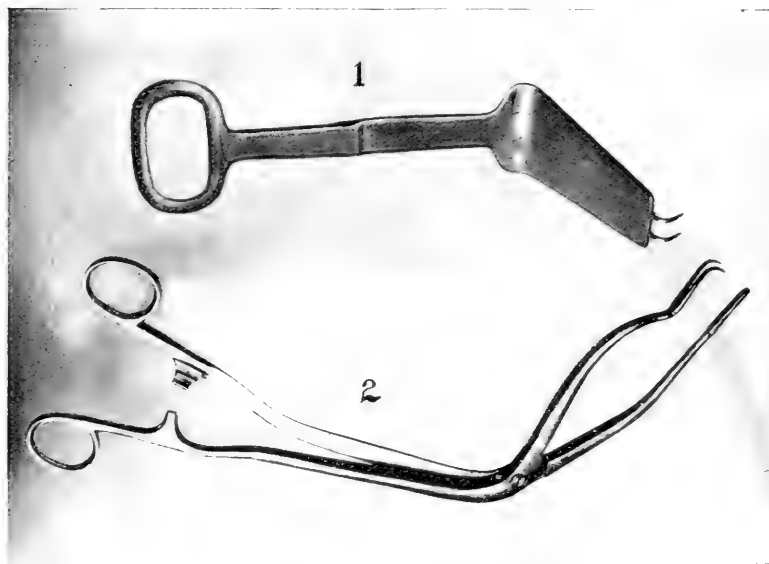


FIG. III—Special Instruments for Trachelectomy

1, Cervical retractor; 2, tenaculum forceps. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

surgical injury. This type of operation is generally adaptable to all cases where cervical surgery is indicated.

CIRCULAR AMPUTATION OF THE CERVIX

The cervix is retracted into the vaginal introitus by means of a number of vulsellum forceps or strong artery forceps, clamped onto the margin of the lips, and with the aid of a special vulvar retractor (having two tenacula points which are secured in the vaginal mucous membrane at the side of the cervix), the vulvar lips are pushed aside and the cervix freely exposed. The field of operation is injected at frequent intervals with a local anesthetic, to which a small amount of adrenalin chloride has been

added. (If the animal is of a nervous disposition, it is well to give chloral hydrate (2 to 4 oz.) orally about an hour before operating.)

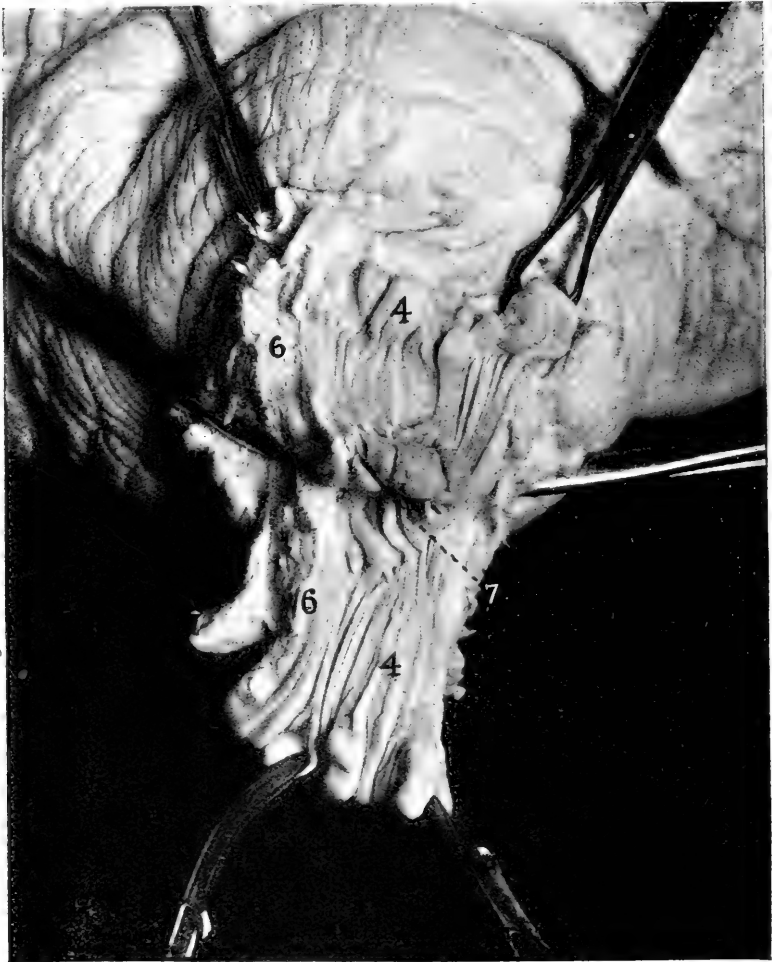


FIG. IV—Circular Amputation of Cervix Uteri.

Cervical core divided by longitudinal incisions (6) into superior and inferior segments, (4). The internal os (7) is shown, bounded posteriorly by the now exposed second annular fold (amputation ends at this point) leaving a free margin of endocervical mucosa as shown in figure V, 8. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

A circular incision is now made through the vaginal mucosa about one-half inch peripheral to the margin of the cervical lips, and the freed margin of the vaginal mucosa grasped at

frequent intervals with hemostats. It is then carefully dissected away from the underlying cervical tissue for a short distance, when loose areolar tissue is met with, allowing the

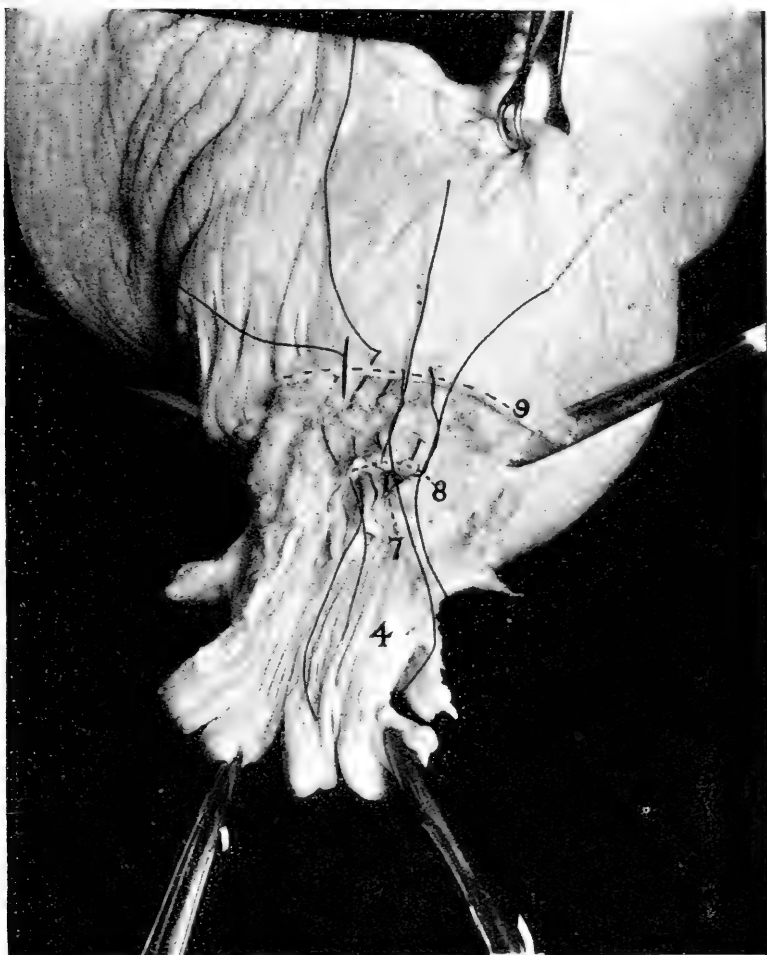


FIG. V—Circular Amputation of Cervix Uteri.

Showing cervix after superior half of cervical core has been excised. 9, margin of vaginal mucosa; 4, inferior half of divided core; 8, semi-elliptical margin of endocervical mucosa; 7, utero-cervical canal. Between 8 and 9 the structure consists of the loose paracervical tissue and the tough cervical fibro-muscular tissue. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

further separation of the cervical core from the vaginal wall to be carried out as far forward as may be desired by simply retracting the cervical core sharply, and with the index finger

separating it from the vaginal wall, tearing down the loose areolar tissue with which it is surrounded. (See fig. III.)

When the body of the cervix is thus enucleated, as far as it appears to be diseased, the core is bisected, making a longitudinal incision through it on either side as far forward as indi-

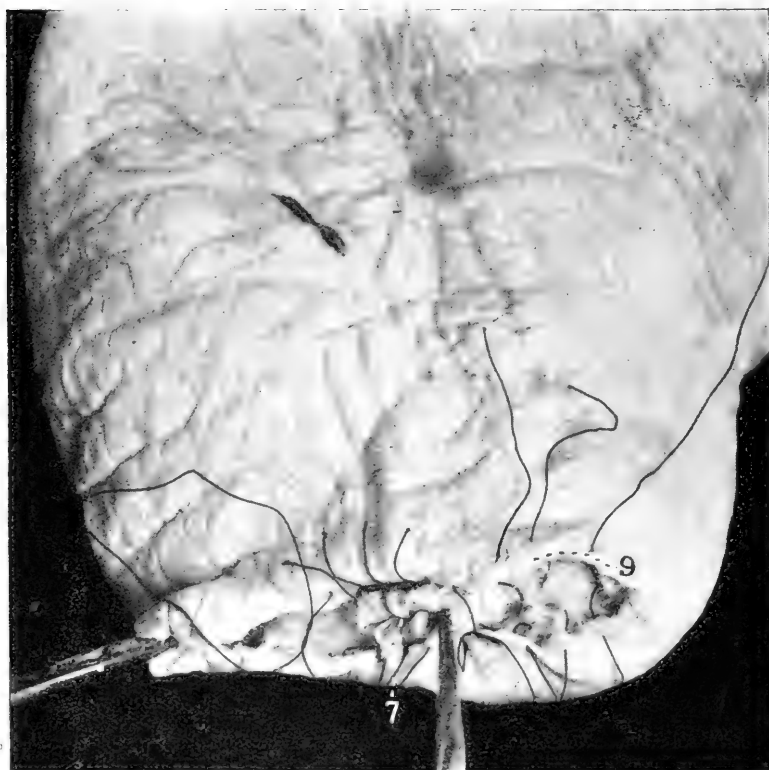


FIG. VI—Circular Amputation of Cervix Uteri.

Showing cervix after excision of both superior and inferior halves of cervical body. Vaginal mucosal margins brought into apposition above and below with the endocervix. Angular sutures at either side bring into apposition the vaginal mucosa and the lateral margins of the endocervical mucosa. On the left side the puckered vaginal mucosa is shown free from its underlying support; on the right it has been removed, leaving an oval opening (9) in the mucous membrane. Vaginal sutures are shown on the right side, each of which includes a small portion of paracervical tissue along with vaginal mucosa and utero-cervical canal. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

cated. Then, using the lower segment for traction, to hold the cervix well into the vaginal introitus, the superior segment is grasped with forceps and pulled sharply upwards, exposing the endocervix as far forward as the two longitudinal incisions have extended. A semi-elliptical incision is now made through the

endocervical mucosa, connecting the anterior ends of the two longitudinal incisions, the convexity of the incision being directed posteriorly. The mucous membrane of this convex portion is separated from the underlying tissue, thus allowing a freely accessible margin for the placing of sutures. The incision is then carried through the muscular and fibrous tissue, completely severing the superior segment. (See figs. IV and V.)

Using 20-day, chromatinized, catgut sutures, size no. 2 or 3, with a $\frac{3}{8}$ or full-curved, cervix needle having a piercing point, the free margin of the vaginal mucosa is brought into apposition with the endocervical mucosa below. Usually three or four interrupted sutures suffice to appose these margins. Each suture should include a small bit of the underlying muscular tissue, in order to cause the firmer union of the parts and eliminate tension on the mucosal margins. At this point of the operation, the cervix is grasped by a specially constructed tenaculum forceps, one jaw having double tenacula, and the other jaw being tongue-shaped, such that it may be passed deeply into the cervical canal without injuring the endocervical mucosa. It is particularly important that the cervical stump should now be firmly grasped with these forceps, because their replacement would be very difficult, should their hold be lost.

The inferior segment of the cervical stump is now excised and sutured in a like manner to that of the superior segment. The endocervical mucosa is thus coapted to the vaginal mucosa, both above and below, but at the lateral commissures, the vaginal mucosa sags away from the endocervical mucosa, owing to a great reduction in the diameter of the os, the vaginal incision being as great as five or six inches in diameter in many cases, while the diameter of the os uteri is reduced to as small as one-half inch. (See fig. VI.)

Coaptation of the vaginal mucosa to the lateral margins of the endocervical mucosa is now secured by a suture on each side through the vaginal mucosa from above, inward, about $\frac{1}{4}$ inch lateralwards from the previous suture (using no. 4, 20-day, chromic catgut), through the lateral margin of the endocervix and out through the vaginal mucosa below at about $\frac{1}{4}$ inch lateralwards from the previous lateral inferior suture. When these angular sutures are drawn tight, the entire circumference of the endocervical mucosa has been coapted to the margin of the vaginal mucosa. At either side there now remains some superfluous vaginal mucosa. Each lateral commissure of

the vaginal wound is now seized with tenaculum forceps and, by gentle traction lateralwards, the extent of superfluous vaginal mucosa ascertained.

An approximately oval-shaped portion of the extravaginal mucosa is now removed with curved scissors from each side, and the margins apposed with interrupted sutures, preferably

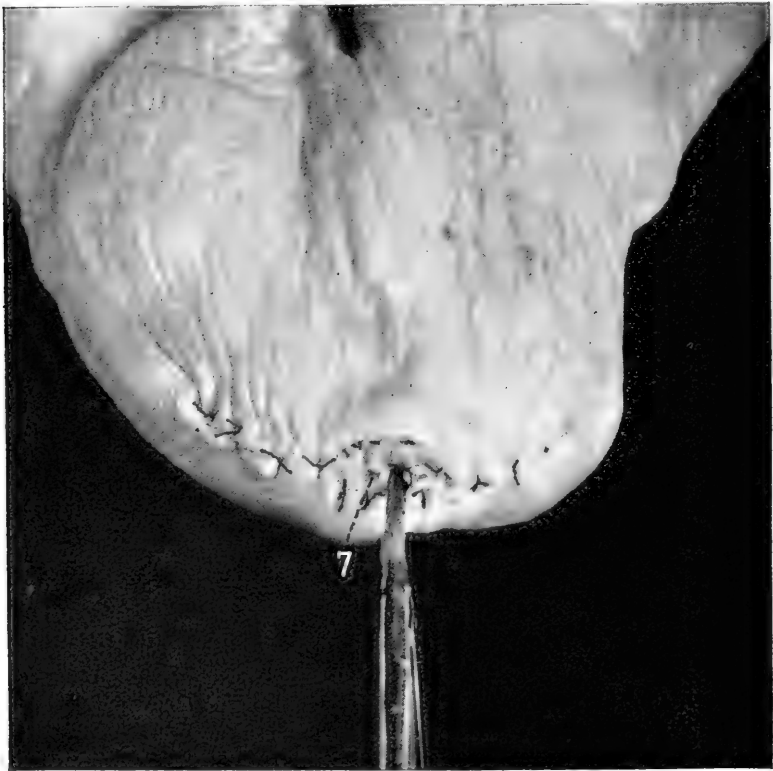


FIG. VII—Circular Amputation of Cervix Uteri.

Operation completed. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

of no. 4, 20- or 40-day catgut, each of which should include a portion of the underlying paracervical tissue, thus eliminating any dead space underneath the mucosa and insuring a prompt and firm union of the apposed tissues. (See fig. VII.)

The operative area is now painted over with tincture of iodine or pure Lugol's solution of iodine, and the cervix allowed

to return to position. No further dressing of the area is required. If the tissues are properly apposed, healing occurs by first intention, and union is firm enough within ten days or so, that the cow may again be placed in service.

DISCUSSION

DR. A. SAVAGE: Mr. Chairman, Gentlemen: This is Dr. Williams' own particular operation in his own special field, and my limited experience scarcely warrants any lengthy discussion of it. Most of us are doubtless familiar with the frequency of cervicitis as an obstruction to breeding, particularly in dairy cattle. Mild cases may be successfully treated, when not of too long standing (and happily that is a large proportion of the cases), by the classical method of swabbing once or twice at, say, weekly periods, with pure Lugol's solution. There are cases, however, which are distinctly out of that class. They refuse to yield to ordinary medicinal treatment, and present a bit of a problem. Being afraid to apply surgery to some of those cases and taking a tip from Dr. Pringle, of Toronto, I treated a few of them by using something more drastic, and added, in a few instances, twenty per cent of formalin to pure Lugol's. In some cases that mixture brought results. It was particularly penetrating, and reached the bottom of those mucous folds which had escaped the action of Lugol's.

There are cases, however, which will yield to no medicinal treatment, and they undoubtedly call for surgical interference. My experience with this particular type of operation has been very limited. To begin with, as an objection to it, I must say that I do not think it is universally applicable. There are animals, particularly beef-type, Shorthorns, (and I encounter them fairly frequently) in which it is impossible to retract the cervix satisfactorily, so much so that swabbing is a difficulty, and certainly an operation of this sort would be impossible. I have tried it three times, learning only as recently as last night that my technique was wrong in all three cases, so I cannot hold that against the operation. The first animal died; the second animal was destined for the butcher, so that she eventually died under the axe and not of the operation. My third attempt was done on a better type of animal, a dairy cow, and I am very pleased to say that I got results. The cervix, when healed, somewhat resembled a grain sack with two ears, because I did not take care of the corners of my wounds properly, but nevertheless the animal conceived, and is now pregnant.

In spite of my clumsy efforts to follow him, however, I think Dr. Williams is to be distinctly congratulated. This is, I believe, *the first definitely constructive operation on the animal genital organs*, and as such, regardless of its technical difficulties, should be the source of a great deal of credit to Dr. Williams. (Applause.) I only trust that, in time, the veterinary profession and live stock interests, particularly those concerned with dairy cattle, will realize the debt they owe Dr. Williams in this respect. (Applause.)

DR. WALTER SHAW: I want to ask Dr. Williams in regard to a forceps that is on the market. In a great many herds, in the treating of sterility, a man will be treating seven, eight or nine cows, and the forceps are most generally quite heavy-tonged. Now, naturally, when you are in a herd of that type, you may run into anything. A great many times this same heavy instrument is used to retract the uterus, by taking hold of the cervix.

I notice in regard to this forceps it has been mentioned that the smooth part was to enter the cervix. However, this forceps that is on the market is the same on both sides. Isn't the taking hold of the cervix with that heavy instrument conducive to cervicitis? I have re-examined these cows that have been treated in that manner, within a few days, and have found a severe inflammation of the cervix. Personally I have discarded forceps, and use the return douche by placing the hand through the rectum. By manipulating the cervix, you will get hemorrhage from the points where the forceps have been used.

DR. W. L. WILLIAMS: In the old type of forceps which is generally used in the retraction of the cervix, there is an opportunity for error, which is very commonly made, which consists of closing the forceps too tightly and crushing the tissues so that they become necrotic or are otherwise seriously damaged. The forceps should grasp only the lips of the cervix and not engage the folds or pass into the cervical canal proper. They should not be closed too tightly nor too great tension applied. If one has in mind these dangers, they may, as a general rule, be avoided. Turn whatever way we may, there are certain dangers.

If we take the plan of the previous speaker, there are certain dangers of injury to the cervix and uterus, because they hang somewhat flaccid, and the instrument is liable to be misdirected. Also, when neither forceps nor speculum is used, the inspection is interfered with; one does not see the cervical mucosa, and consequently the diagnosis is defective. It is important that we see the cervix. In beef and dairy Shorthorns it is often impossible to draw the cervix back far enough to see it. It is not necessary to insert the forceps jaw into the cervical canal of heifers. I often take hold of the vaginal mucosa on either side, and do not touch the cervix at all.

DR. B. T. SIMMS: I would like to call your attention to the difference in the appearance of the cervix before the forceps is applied and after the forceps has been used. In my own experience, I made the mistake many times of using the forceps, drawing the cervix back to where it was easily seen, and making a diagnosis of inflammation when no inflammation was present. The manipulation of the normal cervix with forceps, particularly when we are more or less awkward, will result in hyperemia, so that when the cervical mucosa comes in view it is dark red.

SECRETARY DINSMORE USES RADIO

On December 18, 1923, at the invitation of the American Farm Bureau, Mr. Wayne Dinsmore, Secretary of the Horse Association of America, spoke over radio KYW, at Chicago, on "The Horse—Man's Companion, Servant and Friend." On January 9th, through the courtesy of Brown & Bigelow, he spoke over radio WLAG, at Minneapolis, on "The Value of the Horse in Commerce." Letters received by Mr. Dinsmore, from listeners in far distant points, show that both radio addresses had been widely heard.

TICK ERADICATION PROGRESSES

The efforts of the United States Department of Agriculture and the States cooperating to eradicate the cattle tick in the South are gradually contracting the infested area, in spite of obstacles which are the more troublesome as the end of the long campaign against this costly pest seems to be in sight. Recalcitrant communities are liable to remain longest under quarantine, since they cooperate but grudgingly; nevertheless, the latest revision of the Bureau of Animal Industry orders to prevent the spread of the tick and Texas fever showed that on December 28, 1923, there were 73 fewer counties showing some ticks than a year ago.

FLUKES OF THE GENUS *COLLYRICLUM* AS PARASITES OF TURKEYS AND CHICKENS¹

By WM. A. RILEY

Division of Entomology and Economic Zoology

and

H. C. H. KERNKAMP

Division of Veterinary Medicine

University of Minnesota

During the past year there has come to our attention the fact that a rare and peculiar trematode parasite of passerine birds may also affect chickens and turkeys. This fact seems never to have been noted before, and hence we have collected such data as are available regarding the outbreaks in Minnesota.

In June of 1922 there was brought to the University of Minnesota a six-weeks-old chicken, with a conspicuous group of what the owner described as "blisters" about the vent. At the time, the material did not come to the attention of the writers, but, on the basis of material from birds in the laboratory collections, was identified by Miss Laurene Krogh as cysts of flukes of the genus *Collyriclum*. Fortunately some of the material was preserved by Dr. W. L. Boyd, together with a memorandum as to the owner and location of the affected flock, which was some twenty-five miles from Minneapolis.

On June 29, 1923, a turkey similarly affected was sent to the Veterinary Division of the University by R. C. Shaw, County Agricultural Agent of Northern Ottertail County, some hundred and sixty miles northwest of Minneapolis. The owner reported that a number of his poults were affected, and that some were dying as a result of the condition. It was immediately recognized that this was the same condition that had been noted the year before in the chicken.

The cysts (figure 1) were not limited to the perianal region, but, in addition, extended as a berry-like mass on the ventral surface of the body, immediately anterior to the anus. There was also a group of seven cysts in the skin of the pectoral region. No others were noted on this particular poult.

¹Published with the approval of the Director as Paper No. 406 of the Journal Series of the Minnesota Agricultural Experiment Station. Received for publication, Sept. 4, 1923.

So striking was the condition, and so unique, that the writers made a trip to the locality and farm of Mr. Albjerg, of Vining, Minnesota, the owner of the affected flock.

The surprising fact developed that out of the 110 poults, six to eight weeks old, fifty showed the cysts of the parasite. It was very significant that, as far as could be determined, all of these birds had from the outset the run of a lake shore, some



Fig. 1—A six-weeks-old turkey poult, showing perianal and abdominal groups of cysts of a fluke, *Collyricium*

twenty-five rods from the barnyard. The latter was on a considerable elevation, high and dry. Moreover, the young turkeys had spent the entire time, during the first few weeks, at the lake-side, hovered by the hens, at night, in a marshy meadow near the lake.

On the other hand, the unaffected poultts had been reared on the high ground, without any access to the lake. The owner was confident that if there were any parasitized birds in this group they were strays from the other broods.

Careful examination of the affected poultts showed the same general condition that had been seen in the first one examined. However, it was found that the cysts were much more widely distributed than had been at first supposed. In various cases they were found to extend quite generally over the ventral surface of the abdomen and breast. In rare instances they were found even about the beak, both on the external and internal surfaces. A few were found on the neck, others on the crop. In several instances they extended well down the medial and posterior surface of the leg, as shown in figure 2. They had a tendency to appear in compact groups, though isolated cysts were not unusual.

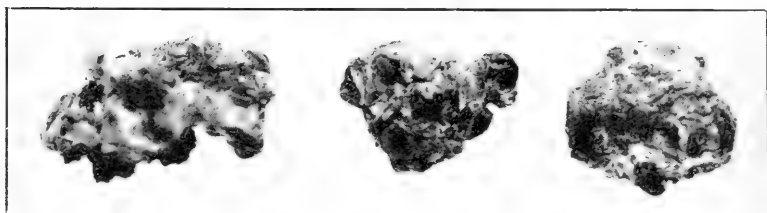


Fig. 2—Necrosed areas, consisting largely of groups of cysts of *Collyriclum* from abdominal region of poult. X3

The cysts were smooth and shiny, grayish-white in color, and varying in size from 2 or 3 mm. up to 10 mm. in diameter. Typically they showed a small black pore, as is apparent from the illustration. In older cysts there was a cap-like mass of black material, covering and surrounding this pore.

Frequently a mass of degenerating and necrosing cysts was noted (figure 3). These could be removed by gentle traction with the fingers or forceps. The surface area underneath was irregular, yellowish-white in color, as appears when necrosed or sloughed. This seems to be the method by which the infection is thrown off naturally by the bird. As will be seen later, it is also an important factor in the distribution of the parasite.

Following the examination of the turkeys, we attempted to get further data regarding the occurrence of this fluke in chickens. We first examined carefully a number of young chickens on the

same farm with the turkeys. We were surprised to find that there was no trace of the parasite to be found on any of them. Mr. Albjerg, who is a close observer, was confident that it did not occur on his chickens.

Later, we made a trip to the place where the infested chicken was found last year. Here again we found that the birds had been reared on the shore of a lake (Lake Minnetonka), under



Fig. 3.—Cysts of *Collyriolum* on leg of six-weeks-old turkey poult. Natural size.

conditions which were comparable with those under which the turkeys had become parasitized. The owner stated that the trouble had been noted in forty-six chickens. He was confident that there was no trouble this season. We were unable to examine any young chicks at this place, but we did examine several year-old hens that had been affected last season. In spite of the owner's belief that there was no trace of the trouble this season, we found several apparently fresh cysts on two of these hens.

On very carefully opening the cysts from the turkey, they

were found to contain two approximately hemispherical flukes, in contact by their flattened surfaces. They fill the cysts so tightly that unless special care is taken the worms are punctured when the cysts are opened. In such a case there exudes a dark brown, almost black, substance, which, on microscopic examination, is found to be made up of the minute, operculate eggs of the parasite.

While this striking parasite has apparently never before been noted for domesticated birds, it, or a very closely related species, is known to occur in various passerines. One of the writers has seen it on English sparrows at Ithaca, N. Y., and, in June of 1919, found it on an English sparrow at St. Paul, Minn. It has been reported by Cole (1911) for English sparrows at Madison, Wisc., and Ripon, Wisc. More recently Tyzzer (1918) has reported finding them, though rare, at Boston, Mass. "Three parasitized birds were found in the summer of 1915, and one each in the summers of 1916 and 1917, although several dozen birds were killed each season."

Stiles and Hassell (1908b) include the blue-jay (*Cyanocitta cristata*) among the hosts of *Monostoma faba*, the name then applied to this parasite. According to Cole (1911), this was based on a finding of the cysts by Dr. Hassell, in 1908, in Maryland.

One of us has found the parasite also in a young robin (*Planesticus migratorius migratorius*) taken at St. Paul in June, 1919. It is significant that both the blue-jay and the robin are distinctively American birds, as is also the turkey.

These seem to cover the records of such a parasite in this country. On the other hand, the American species has usually been assumed to be identical with one known in Europe since 1819. In that year, according to Jegen (1917), Prof. Fr. Meissner exhibited before the Swiss "Gesellschaft fuer die gesamten Naturwissenschaften" a finch (*Fringilla spinus*) which showed a number of spherical swellings which were regarded as *Cysticercus cellulosae* and were apparently not further investigated. In 1831 the contained flukes were described and figured by Bremser under the name *Monostoma faba*. It is by this name that they have been known in most of the subsequent literature.

In 1911, Kossack made a comprehensive study of the *Monostome* flukes, and established for Bremser's species *Monostoma faba* the new genus *Collyriclum*. Ward (1917) points out what he regards as specific differences between the European form.

as re-described by Kossack, and the material reported by Cole (1911). "The American form constitutes a new species, and to it the name *Collyriclum colei* may be given." Tyzzer (1918), who made detailed studies of the form found in sparrows at Boston, does not concur in this conclusion.

The European species, *Collyriclum faba*, has been the object of a detailed study by Jegen (1917). Through his own observations and through examination of the scattered literature, he lists sixteen species of birds found to harbor the parasite. These hosts were limited altogether to the passerine birds. Nowhere in the literature does there seem to be a suggestion of its occurrence on domesticated fowls.

Careful examination of our material, both in whole mounts and in sections, and comparisons with Tyzzer's descriptions clearly indicate that we are dealing with the same species as he. Whether it is identical with the European *Collyriclum faba* or no, we are not prepared to say.

The question naturally arises as to the original source of the infestation of both chickens and turkeys. Concerning the former we have no definite data. As already noted, the parasite has been found in a sparrow and in a robin at St. Paul, and, as no special effort has been made to find it before this summer, it may be fairly widespread in sparrows and other birds. However, careful inquiry among local ornithologists and taxidermists failed to reveal any knowledge of the infestation which is so conspicuous that it could hardly escape attention of those handling bird skins.

During the month of July, 1923, we examined upwards of a hundred sparrows, including fourteen nestlings, from the neighborhood of the two campuses of the University of Minnesota. No instance of infestation was found. There was no opportunity for examining sparrows from the region of the infested poultry on Lake Minnetonka.

On the other hand, we examined a dozen or more sparrows from the turkey runs at Vining without finding any cases. Subsequently, Mr. Albjerg continued examinations, and found two affected sparrows out of twenty-five shot.

So far as we could learn there were no other affected turkeys in the neighborhood, nor have we been able to learn of any other cases of the parasite on chickens in the neighborhood of the Minnetonka flock. The infestation is so striking in appearance that it hardly seems possible that it should wholly escape

notice if it occurs at all commonly in domesticated birds, handled as they are both alive and after killing.

It seems very strange that a veritable epidemic should appear in these two widely separated yards, if it is to be regarded as contracted indirectly from the ubiquitous English sparrow. This is, however, the most plausible explanation at present available.

That the development of *Collyriclum* is direct, as Jegen (1917) believes, seems altogether improbable. While he states that the eggs contain two embryos which in reality are young trematodes, we have seen the fully formed miracidium escape from eggs mounted in water. All of the evidence from the two epidemics which we have noted points to the belief that the life cycle of this parasite resembles that of the typical flukes.

For a period of some weeks the eggs, escaping through the pore in the cyst, are being scattered wherever the fowl goes. Moreover, the previously described necrosed areas (figure 3) slough off and with their myriads of eggs serve as an additional dissemination center. Washed into the nearby lake, the miracidia escape and continue their development, presumably in snails. The infective stage escaping from the mollusc probably encysts in the aquatic larva of some insect which is used, either as larva or adult, as food by the fowls. Studies must be made earlier in the season in order to obtain evidence on this point.

As to the effect of the parasite on the fowls, it is noteworthy that the owners of both flocks assured us that they could readily pick out the affected birds on account of their sluggishness and general unthriftiness. While Mr. Albjerg at first thought that the death of several of his poults was directly due to the parasite, there is no evidence that this was the case. We did not even see indications of discomfort, as manifested by pecking or clawing at the cysts.

In this connection it should be noted that the prevalence of the parasite in sparrows was brought to the attention of Cole because "Occasionally certain individuals in the flocks appeared reluctant to take flight, and when they did so their flight was heavy, as if the birds were in some way weighted down. Such individuals frequently lagged somewhat behind the others, and it was often with difficulty that they managed to alight even so high as the top of a fence." It was such birds that proved to be parasitized.

Quite apart from the effect, direct or indirect, on the bird,

there is no question but that the presence of the parasite would influence unfavorably the market value of poultry. This factor cannot be ignored.

Three of the affected poult were examined post mortem. The bodies did not show marked evidence of emaciation. The combs and visible mucous membranes of the head were apparently normal. The mucous membrane of the cloaca was pale. The feathers were smooth, long and rather oily and well set. The skin, aside from the presence of the cysts (location and description of cysts mentioned above), did not show any peculiarities. There were noted no gross lesions of the respiratory tract; heart and pericardium; oral cavity, pharynx, esophagus, crop, proventriculus or gizzard. In one, a small, raised, whitish-colored patch about 5 mm. in diameter was noted on the mucous surface of the ileum. Histologically, this proved to be a lymphoid hyperplasia (hyperplastic Peyer's patch). In the other poult, several tapeworms (*Metroliaesthes lucida*) were observed. The caeca and terminal parts of the intestine did not reveal gross changes. The contents of the alimentary tube seemed to be of normal amount, consistency and digestion. On the surface of one of the livers, four round, pale areas were noted (beginning necrosis). This was a significant lesion of infectious entero-hepatitis. No gross changes were noted in the spleens or kidneys of any of the birds examined.

A point of interest to be noted is the fact that none of the cysts was situated beneath a mucous membrane. The line of junction between the mucous membrane of the intestinal tract and the epidermis marked the limits of the cyst invasion.

PREVENTIVE MEASURES

A study of the conditions under which infection occurred, and under which certain broods on the same farm escaped parasitism, clearly points out the line of effective prevention. In view of the apparent rarity of the trouble, it is hardly to be supposed that such suggestions need be followed merely as a precautionary measure. Where the infestation is established, or where it occurs in neighboring flocks, the importance of preventive measures is obvious.

The young birds should not be allowed access to lakes, ponds or similar bodies of water.

They should not be allowed to range through marshy meadows which may possibly harbor intermediate hosts of the fluke.

Attention should be directed to the possibility of eggs of the parasite being washed by rains or carried by natural drainage into bodies of water where they may continue their development. Where feasible, measures should be taken to prevent this.

Since it is highly probable that the infection is spread by the English sparrow, we have an additional reason for attempting to eliminate this feathered pest.

BIBLIOGRAPHY

- Cole, L. J.: (1911) A trematode parasite of the English sparrow in the United States. *Bul. Wisc. Nat. Hist. Soc.*, Milwaukee, ix: 42-48, Pl. v.
 Jegen, G.: (1917) *Collyriclum faba* (Bremser) Kossack. Ein Parasit der Singvögel, sein Bau und seine Lebensgeschichte. *Zeitschr. wiss. zool.* cxvii: 460-553, Taf. xi-xii.
 Stiles, C. W. and Hassall, Albert: (1908b) Index catalogue of medical and veterinary zoology. Subjects: Trematoda and trematode diseases. *Bul. 37, Hyg. Lab. U. S. Pub. Health and Mar. Hosp. Serv.*, Wash.
 Tyzzer, E. E.: (1918) A Monostome of the genus *Collyriclum* occurring in the European sparrow, with observations on the development of the ovum. *Jour. Med. Research.* xxxviii, n. s. xxxiii: 267-292, pls. xiii-xvi.
 Ward, H. B.: (1917) On the structure and classification of North American parasitic worms. *Jour. Parasitol.*, Urbana, Ill. iv: 1-12.

A COMPOSITE ANIMAL

The town of Yale, Mich., boasts an animal that has the face of a fox, the fur of a cat, and the bark and habits of a dog. This animal was crossed with a terrier, and two puppies(?), two weeks old, were recently shown at a poultry show, held in Detroit.

FOX INDUSTRY GROWING

Between 18,000 and 20,000 silver black foxes are undergoing the process of domestication in America. The fox-ranching industry represents an investment of more than \$12,000,000, according to latest reports. It is estimated that there are 600 fox farmers in the United States.

WORTH REMEMBERING

The value of time.
 The success of perseverance.
 The pleasure of working.
 The dignity of simplicity.
 The worth of character.
 The power of kindness.
 The influence of example.
 The obligation of duty.
 The wisdom of economy.
 The virtue of patience.
 The improvement of talent.
 The joy of originating.

SWINE DYSENTERY

By R. A. WHITING, Lafayette, Ind.

Perdue University Agricultural Experiment Station

For the past six years the Veterinary Department has received a number of requests from veterinarians and farmers to give assistance in the control of outbreaks of dysentery in swine. This disease is commonly known among stockmen as "bloody diarrhea," because of the bloody appearance of the excreta; and "necrotic enteritis" among veterinarians, because of the necrotic condition of the mucosa of the large intestine, found on autopsy of well-advanced cases of the disease. All outbreaks are sporadic.

Our investigation of early outbreaks indicated that the cause of the disease was a specific infection. At that time traffic in stockyard feeder hogs was unusually heavy, and practically all outbreaks were traceable directly to car shipments from public stockyards. Always a few hogs were noticed affected soon after the shipment arrived on the premises, and within a few weeks the infection would become general. Later, the breeding herd would become infected. The following brief description of herd outbreaks are quite typical of this disease.

Two hundred forty feeder hogs were purchased in stockyards. When the hogs were brought onto the farm, a few were scouring. Fifteen days later, fifty of the hogs had died, a number were sick, and a few seemed to have recovered completely.

On this same farm, the breeding herd was pastured in a field some distance from the feeding hogs. Sixty days after introducing the infection on the premises, the disease broke out in this herd. The sows recovered, but fifty per cent of the pigs died. The following spring these sows farrowed 130 pigs. Two of the sows and practically all of the pigs developed dysentery, and fifty per cent of the pigs died. The sows were moved to new quarters, and in the fall farrowed 90 pigs. About weaning time the disease again appeared in the fall pigs. The death-rate was about the same as in previous outbreaks. Mixed infection bacterins were given, without any favorable results. All of the pigs received anti-hog cholera serum and the sows had been vaccinated. Sanitary conditions were above the average.

Two weeks after a car-load of stockyard feeder hogs was placed in the feed lot, the owner noticed that a number of them

were sick and scouring. Thirty days later the disease appeared in the breeding herd. In this outbreak one brood sow died, and fifty per cent of the young pigs. The disease remained on the farm, affecting successive crops of pigs for several years. None of the brood sows showed symptoms of dysentery after the first year.

Feeder hogs were purchased in two of our large stockyards, three car-loads in all. Ten days after they were unloaded, the owner reported that a number were sick and scouring, and about two weeks later 120 were sick and 40 had died. The well hogs were marketed, and the sick ones were changed from the feed lots to a large pasture, and fed very lightly. They continued dying for about ten days, when the remaining hogs showed rapid and marked improvement. Autopsies did not show any cholera lesions.

A farmer purchased six feeding shotes. Two had a dark-colored diarrhea which the former owner attributed* to the feeding of tankage, for the reason that when tankage was withheld, the diarrhea practically disappeared in the herd. The six hogs were placed in feed lots with 125 hogs that were healthy and had been raised by the owner. About one week later one of the feeding hogs sickened and showed typical symptoms of dysentery. In the course of a few weeks nine had died, and the others were sick or had made a good recovery. There were about 50 young pigs running in adjoining lots. A few of these pigs crawled through the fence into the feed lots, became infected, and carried the disease to the breeding herd. Twenty-nine pigs died. Early in the outbreak the sows were isolated and escaped infection.

In this outbreak the first hogs became infected from the herd getting into neighboring yards and feeding around a manure pile from a pen of dysentery pigs. The owner of the herd from which the original infection came was not acquainted with this fact when he disposed of the six hogs.

SYMPTOMS AND POST-MORTEM LESIONS

Early in the outbreak, a small percentage of the herd is sick. The symptoms are slight fever, slowness in moving about, standing with the head down or lying on the sternum, diminished appetite, and twitching the tail. The body temperature becomes normal about the time that the diarrhea begins. The diarrhea varies in color, depending on the character of the feed. It is

usually mixed with more or less blood and mucus, and in typical cases becomes red or "tomato-colored." If the sickness is prolonged, the emaciation is marked, and the animal becomes very weak.

The duration of the disease varies from a few days to about two weeks; in mature hogs the course is short. In young hogs the recovery may be incomplete, the animal becoming stunted or unthrifty.

In pigs the death-rate varies from 40 to 60 per cent; feeder hogs from 10 to 20 per cent; and in brood sows from 2 to 5 per cent. The general average is about 25 per cent.

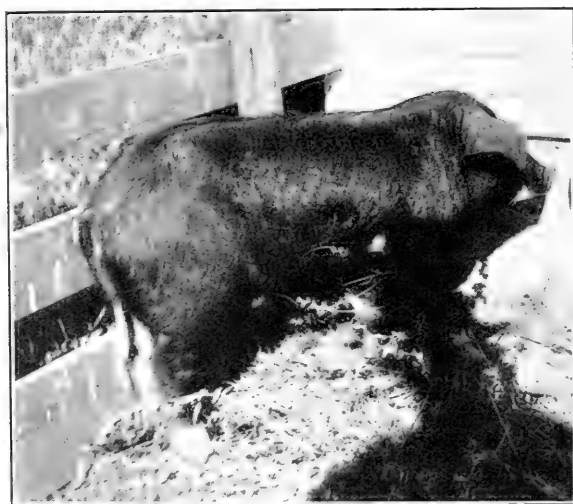


Fig. 1—Young hog showing physical symptoms of dysentery.

The disease is chiefly an infection of the cecum, colon, rectum, and stomach. The small intestine is rarely involved, and then only to a slight degree. In the early stage the pathological changes consist of blood engorgement and hemorrhages of the colon mucosa. Later there is an abundant mucous exudate streaked with blood. Diphtheritic plaques that resemble small particles of fibrous alimentary substance occur on the surface of the mucosa. In the last stage of the disease, diphtheritic, necrotic and ulcerative lesions are quite evident. The necrosis and ulceration may extend to the submucosa, or even to the muscular coat.

MICROSCOPIC LESIONS OF STOMACH AND COLON

Sections of the stomach in early stages of the disease show a well-marked hyperemia, extravasations of blood in the superficial portion of the mucosa and some desquamation of the epithelium. Later a necrosis may occur, involving nearly the entire thickness of the mucous membrane.

Sections of the colon taken early in the disease occasionally show an exudate on the surface of the mucous membrane, containing many polynuclear leucocytes. Usually, the material on the mucous surface consists of mucus, fibrin, bacteria, lymph-

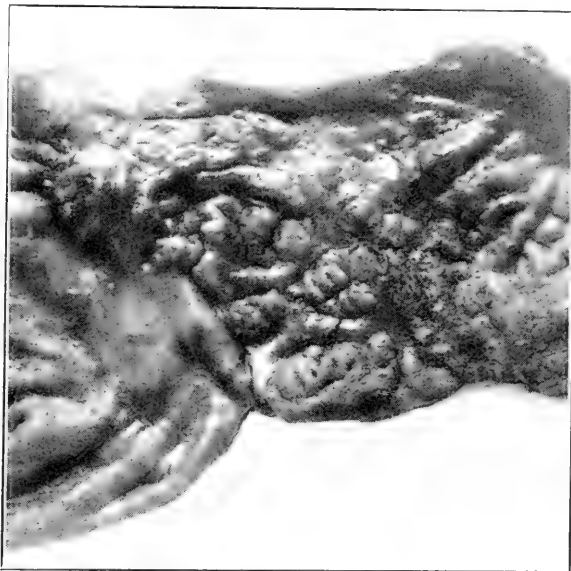


Fig. 2.—Mucosa of colon showing diphtheritic plaques and membrane, and slight ulceration

oid cells, desquamated epithelium, and red blood cells. In the mucosa the blood and lymph vessels are engorged, and there is considerable extravasation of blood, especially in the portion near the lumen of the colon. Just beneath the intestinal epithelium there is usually a well-marked edema. Scattered masses of blood may be present on the surface of the mucosa. At such points the epithelium is destroyed or pushed away from the mucosa by the extravasated blood. The epithelium of the crypts shows numerous goblet cells. Occasionally the submucosa is edematous and hemorrhagic. The diverticula of the

mucous membrane in the submucosa show changes, both in the epithelium and in the mucosa, similar to those occurring in the mucous membrane along the lumen of the colon. The lymphoid tissue surrounding these diverticula may be hyperemic

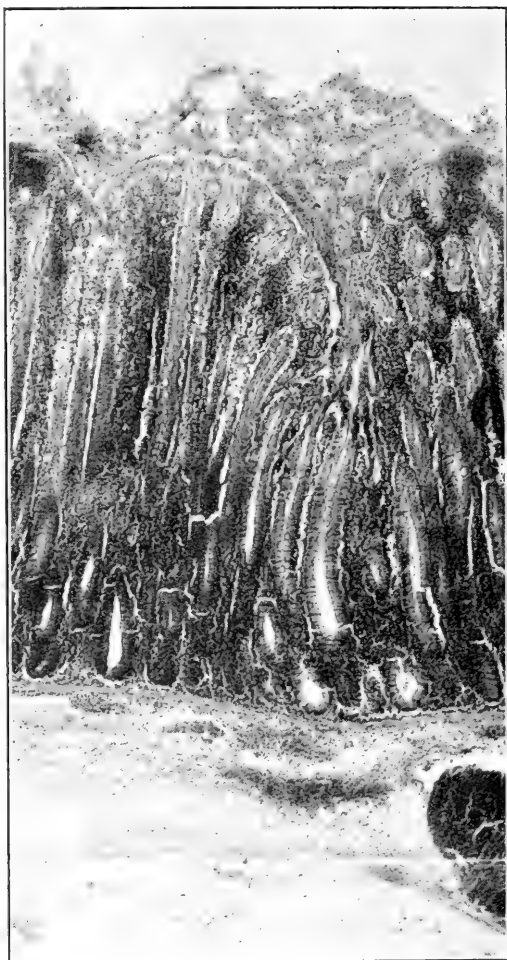


Fig. 3—Mucous membrane and submucosa of colon showing exudate on mucous surface, hyperemia and hemorrhages in mucosa and submucosa

or hemorrhagic. A marked leucocytic infiltration of the colon wall is seldom observed.

Sections of the colon taken in a later stage of the disease show a well-marked catarrh and continuation of the hyperemia. The

blood vessels, especially of the mucosa, are engorged and many show thickened walls. The intestinal epithelium is practically all gone, and a layer consisting of fibrin, bacteria, mucus, and

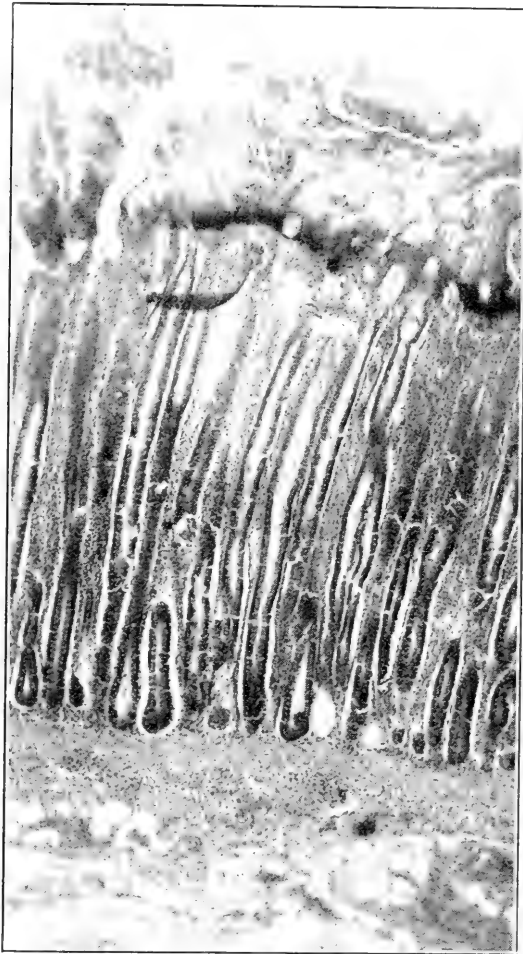


Fig. 4—Mucous membrane and submucosa of colon, showing diphtheritic membrane and necrosis, atrophy of cryptic epithelium and some leucocytic infiltration of submucosa.

cell detritus covers the mucosa. The crypts are distended with mucus, and the epithelium of the crypts atrophied.

Sections of the colon taken in a still later stage of the disease show necrosis extending inward from the surface of the mucosa.

The width of this zone of necrosis may be fairly uniform, or it may be decidedly variable, frequently it dips down to the submucosa and includes a part of it. Beneath the zone of necrosis there is usually a hyperemic and hemorrhagic zone. Thrombosis of the blood vessels in the mucosa and submucosa may be noted.

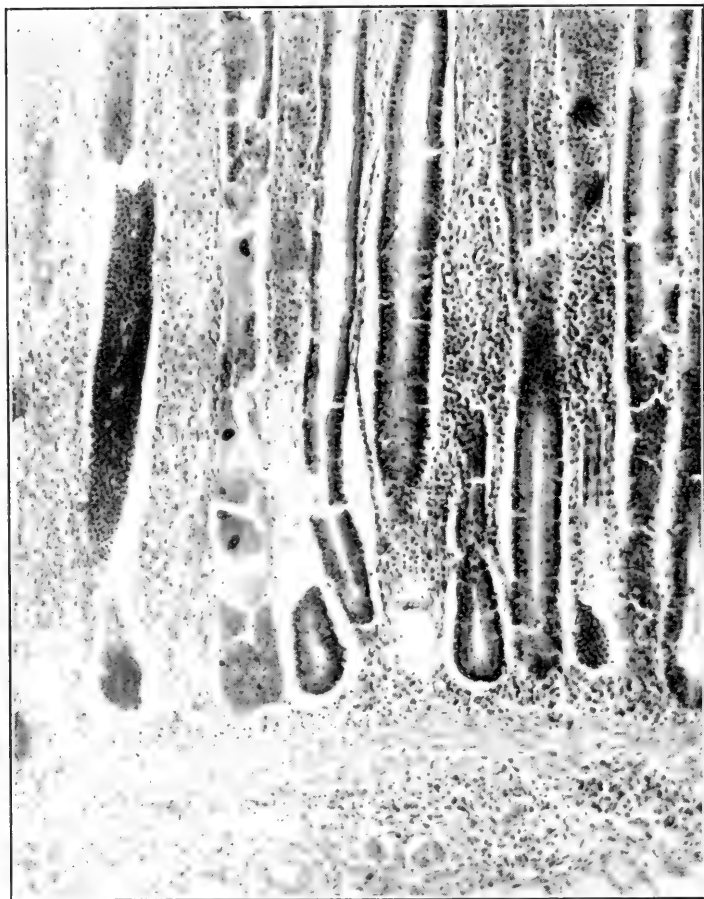


Fig. 5—*Balantidium coli* in crypt of mucosa

Another conspicuous microscopic feature of the colon is the presence of *Balantidium coli*. Parasites occur commonly in the exudate on the surface of the mucous membrane and occasionally in the mucosa, especially if the tissue is damaged. They are not considered etiologically significant in dysentery.

SUMMARY OF EXPOSURE AND FEEDING EXPERIMENTS

Blood obtained from the early outbreaks was injected intramuscularly and intravenously (3–10 cc), and fed (70–100 cc) to non-vaccinated pigs. All of the pigs remained well for 20 days, when they were exposed to the disease and proved susceptible; those pigs that recovered were exposed to hog cholera and died, thus proving the distinctness of the disease from hog cholera.

Colon contents or feces were collected from several different outbreaks that were proved to be dysentery. This material was fed to 28 healthy pigs; 21 of the pigs developed the disease in from 5 to 28 days after eating the contaminated feed; 7 remained well, although 4 of these developed the disease when the feeding was repeated. Three pigs in one experiment did not develop the disease.

The viscera, except the small intestine, of four typical acute cases of the disease were fed to three lots of eight to ten pigs, each lot being divided into four groups. The hearts, lungs, livers, spleens, and kidneys were fed to lot 1; the stomachs to lot 2; and the caeca and colons to lot 3. Following the four feedings of hearts, lungs, livers, spleens, and kidneys, all of the pigs remained well; they were then exposed to dysentery and proved susceptible. Of the four groups of pigs fed stomachs, one group developed the disease and three groups remained well. The pigs in two of these groups proved to be susceptible upon exposure to the disease, while the susceptibility of the other group of pigs could not be determined. Each of the four groups of pigs that were fed the caeca and colons developed the disease. The pen control pigs remained well for about ten days after the other pigs began to show symptoms.

VARIATION IN PERIOD OF INCUBATION

Variations of the interval of time between the possible introduction of the virus of dysentery and the development of initial symptoms depended upon the methods used, whether infectious material was fed or whether the hogs were given pen exposure. Usually greedy hogs, or those fed a liberal quantity of virulent material, had shorter incubation periods than hogs which had received rather limited quantities of material or had been given pen exposure.

The earliest observation of visible symptoms in the different groups of hogs was as follows: Feces or colon contents were

fed to 28 hogs; 25 developed symptoms in from 5 to 18 days. Colons or sections of colons were fed to 34 hogs; 25 developed symptoms in from 7 to 18 days. Of 130 hogs given pen exposure, 117 developed symptoms in from 5 to 39 days. In the cases of the long incubation periods, where the hogs were given pen exposure, there actually occurred one or more active exposures within that time, as fresh cases were more or less constantly developing.

Naturally, of two exposed pigs, the one which ate its feed greedily or consumed the infectious material readily, received the greater degree of exposure and sickened first. Of the 192 pigs exposed to the disease by feeding, or pen exposure, 176



Fig. 6—Comma-shaped micro-organisms in section of colon, stained with silver nitrate (Warthin-Starry method). In this portion of crypt these micro-organisms predominated.

(87 per cent) developed the disease, while 25 (13 per cent) did not show visible symptoms. All of the pigs that did not develop the disease were later fed virulent material and remained well.

CULTURE FEEDING EXPERIMENTS

Cultural inoculations from heart-blood, lungs, liver, spleen, and kidneys of acute cases were usually sterile. Similar inoculations from the less acute and chronic cases resulted in the isolation of a number of different bacteria. Arranged in the order of frequency of isolation from the tissues these were: *B. suispestifer*, *B. coli*, *B. paracoli*, *B. pyocyaneus*, *B. alcaligenes* and *B. suissepticus*.

Feeding experiments with 50–150 cc pure culture of each of the non-paratyphoid bacteria gave entirely negative results. Feeding experiments with *B. suispestifer* (50–150 cc) showed it to be pathogenic. Nine strains of *B. suispestifer* isolated from different outbreaks were fed to nineteen pigs. All showed at least some evidence of illness, and six died after showing high body temperatures, loss of appetite and diarrhea. Of thirteen control pigs, three became sick and two died.

The culture-fed pigs were fed in separate pens, and moved from one to three hours later to pens that contained the control

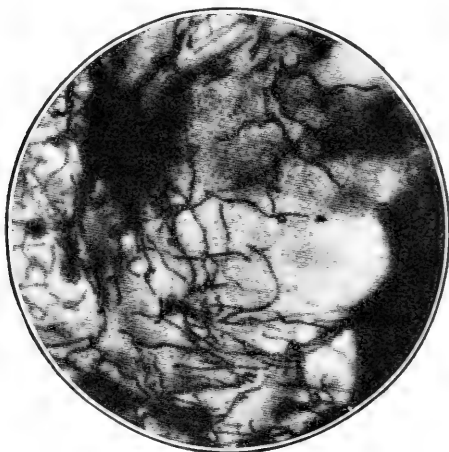


Fig. 7—Micro-organisms in section of colon, stained with silver nitrate (Warthin-Starry method). In this portion of crypt these micro-organisms predominated

pigs. The diarrhea that occurred subsequent to feeding *B. suispestifer* was never bloody. Those pigs which died showed extensive necrosis of the gastro-intestinal mucosa, congestion of the visceral lymph glands, and in some case hemorrhages of the lungs and purplish discoloration of the skin. Nineteen of the surviving pigs were later exposed to dysentery on an infected farm. Practically all of them developed the disease.

Cultural inoculations from dysentery feces and colon walls showed a preponderance of *B. coli*, together with paratyphoid-enteritidis variants, *B. necrophorus*, vibrio-like bacilli, spirochetæ and amoebæ. *B. suispestifer* could not be isolated from the feces.

B. necrophorus cultures were obtained by inoculating rabbits with scrapings from the colon mucosæ of dysentery pigs and transferring to anaerobic media. Several pigs, which were fed

cultures of from 10 to 20 grams of the rabbit-ear abscesses, remained well from 16 to 20 days, when they were exposed to dysentery and developed the disease. Similar results were had in feeding cultures of amoebae and spirochetæ.

SUMMARY

This disease presents all of the characteristics of dysentery.

It is a distinct infectious disease of swine, introduced into sections, where sporadic outbreaks were investigated, by stock-yard feeder hogs.

It may be reproduced by feeding feces, stomach tissue and contents, and large intestine and contents, from dysentery swine that show acute symptoms or that have died.

B. A. I. HISTORY TO BE PUBLISHED

On another page in this issue is the official announcement of the publication of a history of the Bureau of Animal Industry, in connection with the marking of the fortieth anniversary of the organization of the Bureau, in May. Every veterinarian should have a copy of this book in his library. If three thousand copies are sold, the cost per copy will be only one dollar. If a less number are ordered, the price will be higher. Keep the price down by sending in your order. (See page 682.)

AIREDALES HOLD THEIR OWN

American Kennel Club registrations, the most reliable barometer in dogdom, do not show a falling off in Airedales, as many believe.

The shepherds still hold the lead, of course, with 26 pages of registrations. Boston terriers come next with 19 pages, and the Airedales third with 14 pages, the latter representing about 630 dogs.

REGULAR WAR HORSE

A farmer sold a horse to a cavalry officer, warranting the animal to be a first-rate war horse. Some time afterward, the officer came to the farmer in a rage and said: "You call this animal a good war horse? Why, there's not a bit of go in him! A good war horse, indeed!"

"So he is," replied the farmer. "Sure, he'd rather die than run."—*Pittsburgh Chronicle-Telegraph*.

HONESTY OF PURPOSE¹

By HARRY GIESKEMEYER, *Fort Thomas, Ky.*

President of the Kentucky Veterinary Medical Association

Honesty of purpose—that is the real keynote of success for any veterinarian, no matter what part of the profession he follows. To practice veterinary medicine is, first, to know intimately the profession you are representing. I stress this first, because it is the all-important point in building a practice. You can not study your profession too closely. You can never know all about it, no matter how much you think you know. Devote yourself to a careful, rigorous knowledge of your profession. Thus equipped you will be keyed up to a quick response in your come-back arguments. Believe in what you represent; if you do not, drop the profession and take up something else. You can not practice a profession in which you can not convince your inner self that it possesses the very highest merit. That is half the battle.

But, let me caution you, you must use all the tact within you, and character analysis in selecting your come-back arguments which you have stored within your reserve, and change the wording of expression according to the analysis of the client you are trying to represent. You can not qualify too strongly in character analysis. Read everything you can get your hands on along character analysis, and apply it to your practice.

We have all heard the time-worn remark: "Veterinarians are born, not made." I never will agree with that statement. I have worked against men, and with men, who, by all the rules of the game, should have been classified as born veterinarians, and men who, on first meeting them, would give any person that impression—men in whom one could put absolutely full confidence—men with a gift of words quite unique, yet, I have seen dozens of such men fall by the wayside.

Why? Because they thought they were "born veterinarians," and as such, feeling their superiority over the rest of us poor mortals—we hard-working, every-day pluggers, they were over-confident, and talked themselves in and out of a practice. A practice that is in and out, you will agree with me, is usually

¹Read before the Kentucky Veterinary Medical Association, Lebanon, Ky., July 25-26, 1923.

OUT; so is the veterinarian who uses the poor judgment of permitting this to happen.

That is why I say that, although veterinarians may be born right enough, they have to be made over into real articles by hard work and study before they are really useful. The "born veterinarian," the self-conceited sort, usually finds the short route into the discard; while the hustling, every-day plugger—the man who knows he has to dig for his practice and qualifies himself for his work by studying his profession—gets intimately acquainted with character analysis, and goes after business scientifically, the man who knows no certain hours in which to do his practicing, the man who can sell himself before he attempts to sell his professional knowledge to others, as a rule gets where the "born veterinarian" would like to get, but never lands. The hard-working veterinarian has no time to kick and dictate and make himself a nuisance. It is only the "born veterinarian" who knows more than anybody else, and who does not think it necessary for him to study veterinary medicine in every branch that applies to practice.

Personally, I have had as many ups and downs as any man. But I have always held before me one motto, and have had a good many hard spills with it in my possession, yet I hung on to it through all. When I was a boy my mother would frequently say: "Son, whatever you do, do the best that's in you. Never admit that it can not be done. Go out and do it."

When calling on a client ever bear in mind that you are just as big a man as he is; that you are not asking a favor, but extending one, by letting him have your knowledge.

Keep up your appearance. To be successful, you must look successful. Be sincere, and, above all, get your memory to work well. Remember the man's name, repeat it frequently in your talk to him. It is insidious flattery to call a man by name—it is showing a direct personal interest in him which he appreciates—it brings you into closer personal touch with him. You can get more out of a clam by flattering it than by ignoring its vanity. Every human being likes to be prominent enough to have his name stand out.

Money, money, money—dollars and cents. We are measuring things by money. We measure the worth of men by money, and I am not talking to a bunch of millionaires, but, if I were, I would not say anything else, nor have I ever failed to say it. Money is the greatest curse of the whole universe, but when

we have understanding, then the desire to do good to the other fellow is the compensation. Money is simply a means of exchange.

Thus is my problem solved in the measure that I give service unto you. That is why I am more interested in you than in any other phase of the personnel that means so much to this organization. Without a veterinary organization we can't go on. We must market our services, and we can not get along without veterinarians. We must fit into one another, we must stand for our policy—the policy of doing right. You veterinarians are the forerunners of our profession, the message of what this organization stands for, and the live stock breeders must be thoroughly sold on this policy.

Veterinary medicine must be based on honesty of purpose. I wish to show you how the veterinarian stands in the eyes of the world; to define more clearly the greater force the veterinarian has with honesty of purpose behind him. Individuals, no matter who they are, men, women or children, in all of their steps, sell themselves to others. We are all selling or advancing something good or something bad; we are either constructive veterinarians or destructive veterinarians; we are either part of the positive class or on the negative side.

A veterinarian who goes out as a negative veterinarian has little value or force, and therefore never amounts to anything. When a veterinarian lacks positiveness he is devoid of power, and fails to convince and impress others. The man who is positive knows what he is talking about, he knows what he is doing, and, therefore, has convincing power to bring others to his viewpoint. It is written: "Ye shall know the truth and the truth shall make you free." It is quite clear that no man is free nor is he comfortable in his own conviction unless he knows the truth about the thing with which he deals.

The high standard of veterinary medicine is based on truth. I can well remember the time when most "horse doctors" that I came in contact with were gigantic liars and were working on the wrong basis. Such practice is fast becoming a thing of the past.

Now for a little individual thought as to what veterinarian means. Do you know there is no vocation that means so much to man? I know of no greater collective force for the spreading of advance thought to civilization than the force represented by veterinarians! He has the greatest field imaginable for the

spreading of good, and plays a large part in the educational endeavor and, therefore, should fully realize his responsibility in spreading at all times a truthful message.

I want to say that if this assembly here today will go out with the full determination of doing what we are talking about, we can convert the State of Kentucky, yes, the whole United States, into using better veterinary service, right from this little gathering.

There is only one thing lacking, and that is to get down to the fundamentals, the foundation stone of success: Honesty of purpose. We can progress into the more sublime and more successful surroundings only when we base all that we do on honesty of purpose.

I want you men to keep this idea in mind from now on; that we are going out, determined never to lie, never to misrepresent anything, whatsoever; that we will spread the gospel of truth about all things, and that we will go out to do the greatest measure of good to the greatest number.

Veterinary medicine is not a plodding drudge; on the contrary it is a lofty occupation, it is among the headliners in professional pursuits.

You can always tell what kind of a man you are going to meet when you look into his place. Men express exactly what they are by what they say and do, how they dress and live, and the order in which they conduct their place, for it is written: "By their works ye shall know them."

The simple thing to do is to become students of what you are doing. What is your biggest asset? What is the biggest asset man has, personally? Study the man you come in contact with, judge him through your observation, always have in mind to lift him up and to benefit personally by the good he reflects, either to take it all and use it as an improvement of your own conduct or to improve him by your advance knowledge of better things. Remember that you can not help the fellow that will not help himself, nor can you improve if you are not receptive and desire better things.

We live in the universal force of knowledge and betterment, and it is up to us to adjust ourselves to it. The understanding of this great fact will make you a force for good among men.

The world needs more men who realize their responsibility for doing the greatest good. What is needed everywhere is men of conviction and unselfish service. The veterinary profession

needs just that sort of men, needs more leaders, more pioneers in promoting one of the greatest factors in home life for the betterment of conditions of health and comfort, which in turn will reflect the greatest harmony into every phase of social, industrial and business life.

Stimulate your efforts to become leaders, go out and give those with whom you come in contact an inspiration from the new message of the power of honesty of purpose. Live it and act it, in everything you do.

Remember that men are alike in every territory no matter where you may go, you will find that men practice all of the traits that you might in any other place. Your field, therefore, is large, and it is up to you to be busy about the biggest business of doing the greatest amount of good for the benefit of the greatest number. I am absolutely confident that each of you has the same force about you and among you, and that each one of you has the power to get into the understanding of the message that you want to give out.

A FINE COMPLIMENT

In the December number of the *Military Surgeon* there was printed a special dispatch to the *New York Herald*, from Havre, France, in which the French army surgeons paid a very high tribute to the American military service, after the visiting surgeons had attended the American Army Surgeons' Association Congress, at Carlisle, Pa. The dispatch went on to say that Professor Charles Porcher accompanied the French army surgeons on their return trip. The dispatch referred to Professor Porcher as one of the greatest European authorities on milk, and he was quoted as having said that America has the best milk in the world. Following his attendance at the Montreal convention of the American Veterinary Medical Association, Professor Porcher attended the World's Dairy Congress and later the meeting of the International Dairy Association, in Seattle, Wash.

PLEGGED TO USE PUREBREDS

Farmers who have joined the Better Sires—Better Stock campaign, and by so doing pledged themselves to use only purebred sires of any kind on their farm, now number more than 12,000, according to the latest figures published by the United States Department of Agriculture.

THE CONTROL OF RABIES¹

By JOHN REICHEL, *Glendolden, Pennsylvania*

The control of rabies is a task that centers itself in the prevention and treatment of the disease in dogs and chiefly in dogs actually bitten by rabid animals. Exposure invariably consists of a wound inflicted by a rabid animal, and anything less might very well be regarded as no exposure at all. In fact, the only form of exposure that need be seriously considered in this disease is the bite inflicted by a rabid animal. Dogs which have been with a rabid dog, but have not been wounded by it, have not actually been exposed. Unfortunately, however, it is not always possible to know all dogs that have been bitten in a given outbreak. It is, therefore, best to assume in the control of the disease that more than the dogs known to have been bitten have been so exposed, and to enforce strict quarantine measures.

The most important problem in the control of rabies is the disposition of the bitten or exposed dog. The destruction of the animal, while an effective method, is not one that can be carried out in each instance, and therefore the question arises—can such an animal be protected from the development of the disease, thereby saving the life of the animal and preventing others from being exposed? This procedure, however, is complicated right at the beginning, inasmuch as the infected dog may have been bitten unobserved or in such a manner as to leave no appreciable wound. Therefore, precautionary measures, as required for infected animals, should be applied to all dogs in a given locality to make certain that any dog that might prove a menace later is taken care of.

The control of rabies depends entirely upon the application of any one of the three following procedures:

1. Destruction of all dogs in a given area, suspected of having associated with a rabid animal.
2. Individual quarantine over a period of not less than 100 days.
3. Protective immunization.

The effectiveness of the first two procedures has been established when properly carried out; but in both the welfare of the dog is sacrificed to such a point that owners object. Destruction

¹Summary of remarks made at the fortieth annual summer meeting of the Illinois State Veterinary Medical Association and the Fourth University Veterinary Conference, Urbana, Illinois, July 12, 1923.

of the dog ends the problem, but muzzling, with and without quarantine, only prevents the spread of the disease. It in no way reduces the chance of the development of the disease.

Protective immunization, if effective, saves the dog and eliminates the possibility of its spreading the disease. This is best assured by the use of a *killed* rabies vaccine which in itself is incapable of infecting any animal injected.

Experiment No. 127¹ dealt with the problem: "To determine whether or not a 'dead' or non-infective vaccine was equal to a 'live' or infective vaccine as an immunizing agent in the single-dose treatment," and it was shown that

"1. 'Dead' rabies vaccine, in the single-dose treatment used, can be said to have immunized and protected, since (1) five out of the twenty treated dogs remained alive for more than 100 days after the injection of 'street virus'; (2) only one out of the twenty treated dogs developed rabies after the injection of 'street virus'; (3) all nine untreated dogs developed rabies after the injection of 'street virus.'

"2. To avoid a high percentage of accidental deaths in an experiment of this sort, the dogs should be kept in individual cages, properly housed and carefully rationed.

"3. A clinical diagnosis of rabies must be supported by the results of the subdural injection of two rabbits with the brain emulsion of each dog."

In this experiment the dogs were injected with 'dead' rabies vaccine on June 23, 1922 and injected with the infective dose of live street rabies virus on September 23, 1922, three months later.

Well controlled experimental data are needed to support the claim that any form of rabies vaccine treatment is effective following natural or artificial infection with virulent virus. Experiments are underway at this time, with sheep and dogs, in which all of the animals are injected intra-ocularly with live street rabies virus, and then treated with an injection of dead rabies vaccine, single-dose treatment.

It has been amply shown, as borne out by Experiment No. 127, that dogs can be immunized with dead rabies vaccine, in the single-dose treatment, sufficiently to protect them against infection three months later. General protective immunization of dogs in a given locality can therefore be recommended on a

¹Rabies Vaccine Canine. Single Dose Treatment. John Reichel and J. E. Schneider. Jour. A. V. M. A., LXIII (1923), n. s. 16, 1, p. 83.

sound basis. The single injection of dead rabies vaccine has proved to be sufficient.

When an animal is infected with virulent street rabies virus, through a bite of a rabid animal or otherwise, the animal immediately starts on the period of incubation of the disease, which may vary from ten days to as long as a year. In the shorter periods the virus apparently travels quickly from the site of infection to the central nervous system, and inasmuch as the rabies vaccine requires considerable time to immunize, the infection proceeds and the animal develops rabies without even the period of incubation being affected. Therefore, the shorter periods of incubation are of greater concern in the control of rabies by protective immunization with dead rabies vaccine single-dose treatment than the long periods.

Protective immunization in the control of rabies should include the prompt injection of all dogs, and those known to have been bitten placed under quarantine for at least thirty days. It has been our experience that dogs infected and then injected with dead rabies vaccine single-dose treatment, will not develop rabies if they survive thirty days of the period immediately following exposure.

Dead rabies vaccine, including 2.5 to 3% total solids in a 5-cc dose, is ample for any dog regardless of size, and not too much for the smallest. The amount of material in such a single-dose treatment is practically equivalent to the amount included in the multiple-dose treatments of six or more injections. The success of any form of rabies vaccine treatment depends largely on the shortness of the period between exposure and injection, and the immunizing value of the single or initial dose. Therefore, if the single dose includes a sufficient amount of material to protect, additional doses, while they may add to the protective immunity, are in reality of little or no practical value.

Briefly summarized, the control of rabies is possible by protective immunization when 5 cc of dead rabies vaccine, with 2.5 to 3% total solids, are injected into each dog quickly enough after exposure, and when those known to have been bitten are kept under observational quarantine for a period of at least thirty days.

Modern methods of killing whales threaten extinction of the great sea-mammals in southern waters. They have nearly disappeared from the waters of the North.

THE LATEST METHOD IN THE CONTROL OF CHICKEN POX AND ROUP BY VACCINATION¹

By J. W. FULLER, *Ithaca, N. Y.*

Chicken pox in the last few years has caused more financial loss among poultrymen of New York State than any other disease of adult fowls. The loss is not only in birds that die from the disease but a decreased egg production at the time of high-priced eggs and weakened chicks hatched from hens that have been weakened by a severe case of chicken pox. Chicken pox vaccination in New York was started at the request of some poultrymen who had had such severe losses from chicken pox that they feared they would be forced out of business.

HISTORY

Although chicken pox has been known for a great many years, it is only recently that vaccination has been tried.

Following is a brief description of the methods used:

1. Drying and grinding in a mortar chicken pox scabs and cankers. These are then mixed with physiological salt solution and bile from diseased chickens and heated in a water bath at 55-60° C. for one hour. The mixture is then strained through sterile cheese-cloth, to remove the coarser particles, into sterile bottles. One cc (mil) of this is injected under the skin of the breast at three- to five-day intervals.

2. Same as no. 1, but omitting the bile.

3. Inoculating a chicken on the tip of the comb with chicken pox and cutting the lesion off on the tenth day.

4. Heating chicken pox scabs at 100° C. for one to two minutes and pouring off the clear fluid. This is injected under the skin of one side of the breast followed by an injection in five to eight days on the other side.

5. By using only the scabs that form on the comb prepared and used the same as in nos. 1 and 2.

6. Avian mixed bacterin. Several strains of bacteria are isolated from discharges from the nose, eyes or mouth of birds suffering from roup. The bacteria are grown on agar in a bacteriological incubator at 37.5° C. for twenty-four to forty-eight hours. They are then washed off with physiological salt solution which is 0.5% carbolic acid and heated for one hour at 55-60° C., and cooled on ice or in running water. The mixture is then filtered through sterile cotton into sterile bottles. One cc is injected under the skin of the breast at intervals of three to five days, usually three injections are sufficient.

7. A mixture of five and six are used. As no. 5 has been used most extensively, the technic of its preparation will be given in detail.

TECHNIC

The vaccine is prepared from tumors taken from the combs of cockerels or cock birds artificially inoculated with chicken pox. Combs of healthy cockerels or cock birds are moistened with a suspension in sterile water of dried, ground, chicken pox tumors or tumors taken from fresh cases of chicken pox. The comb is

¹Read before the Annual Poultry Convention, Amherst, Mass., July 25, 1923.

then vigorously scarified with a dull knife until the blood shows on the surface. Both sides of the comb are used. The tumors are ready to remove in from three to four weeks after inoculation. After removal, they are dried for twelve to twenty-four hours in a bacteriological incubator, kept at a temperature of 36-37° C., ground in a coffee mill, then in a ball mill for twenty-four to seventy-two hours. If perfectly dry, this powder will keep for months and should be stored in dark-colored, sterile bottles until needed in the preparation of the vaccine.

One gram of the powdered, desiccated virus is placed in a sterile mortar with a sufficient amount of sterile salt solution to make a paste and ground until the mixture acquires a smooth, cream-like consistency. To this mixture is then added sufficient sterile salt solution to bring the volume up to eighty cubic centimeters. It is then poured into a sterile flask or bottle, placed in a water-bath and heated at a constant temperature of 55° C. for one hour. It is then filtered through sterile cheesecloth into sterile bottles and to it is added twenty cubic centimeters of sterile salt solution containing 1% of phenol for a preservative. It is now corked with sterile corks and placed in cold running water or on ice until cooled.

METHOD OF ADMINISTERING THE VACCINE

The vaccine is administered by injecting it beneath the skin of the breast under the right wing with a hypodermic syringe. The dose is one cubic centimeter. An assistant should hold the bird. Both wings are held with the left hand and both legs with the right hand. The bird is then placed on a table on its left side, with its breast toward the operator. The skin should be cleansed with a 2% solution of pine oil or other good antiseptic, picked up with the thumb and forefinger of the left hand and the needle inserted with the right hand. The dose is injected and one finger placed over the needle wound as the needle is withdrawn, and the area gently massaged. The needle best adapted for this work is a 16- or 18-gauge needle at least an inch and one-half long. Care must be taken to keep the vaccine well shaken while using. One cc of vaccine is used.

From February, 1921, to May, 1923, inclusive, a total of 72,315 doses of vaccine were used against chicken pox and roup.

RESULTS

Chicken pox vaccine.—In the winter and spring of 1921, 2600 birds affected with chicken pox were given one dose (1.0 cc).

Of these 2200 (80.4%) recovered shortly after vaccination and showed a marked increase in egg production. In 400 (19.6%), there seemed to be no improvement. These 400 birds had less than two square feet of floor space per bird and were heavily infested with large round-worms and tapeworms.

In the fall and winter of 1921 and 1922, 5343 birds were vaccinated with one dose before chicken pox appeared. No cases of chicken pox developed in these flocks. In infected flocks, 10,185 doses were used as a curative, one dose being given. No new cases developed and all but the very worst cases recovered.

In the fall, winter and spring of 1922 and 1923, 34,585 doses of the vaccine were used, one dose being given. A report was received on 21,759 doses or 62.6%. Of these, 11,900 doses were used as a preventive. Of these, 8100 (68%) remained free from pox, 2600 (21.8%) had light cases of chicken pox, while 1200 (10%) developed bad cases of chicken pox. There were 9,859 doses used as a curative. In 6759 (68.3%) the spread of disease stopped and diseased birds recovered in from one to two weeks after vaccination. In 3100 cases (31.7%) there seemed to be no improvement.

Avian mixed bacterin.—In the winter of 1921-1922, 1000 doses were used in flocks affected with watery noses, bad eyes and cankers of the mouth. All reported good results. One cc was injected subcutaneously.

In the fall and winter of 1922-1923, 13,850 doses were used. Only 4551 (32.8%) of these were reported on. All reported favorable results.

Mixture of chicken pox vaccine and avian mixed bacterin.—In the winter of 1922-1923, 3960 doses of the mixture were used in infected flocks. One cc was given, one dose being used. All except the very worst cases recovered in one week and no new cases developed.

One flock of sixty hens affected with chicken pox was vaccinated with one cc of the chicken pox vaccine. One week later they were given one cc of the avian mixed bacterin. Five days later they were given another dose of avian mixed bacterin. All recovered shortly after the last vaccination.

CONCLUSIONS

1. Chicken pox vaccine has both a preventive and curative action. One dose of one cc should be given at about the time pullets go into laying quarters in the fall, in localities where

chicken pox is known to exist. As soon as chicken pox is noticed in a flock, the entire flock should be vaccinated with one cc and the worst cases removed and vaccinated every third or fifth day with one cc and treated locally.

3. Flocks that have both roup and chicken pox should be given a mixture of the chicken pox and avian mixed bacterin or should have one dose of chicken pox vaccine followed by one or two doses of avian mixed bacterin at three- to five-day intervals.

3. Flocks that are heavily infested with worms or are overcrowded do not respond so readily to vaccination against chicken pox as do flocks that are properly housed and free from other diseases.

HERE AND THERE

Animal interference with telephone service includes bears that mistake the humming of wires for a swarm of honeybees; squirrels that chew holes in the lead sheath of cables; ants and beetles that eat metal, and spiders that throw their webs across open wires, causing short circuits when dew gathers on the web.

A honeybee's work consumes about half the hours of daylight, the remaining hours of the twenty-four being spent in rest, according to tests made by the United States Department of Agriculture.

There are many wild horses on the island of Iceland. Formerly they were shipped to England for use in the mines, but that market is closing since mining machinery was adopted.

Animal hunters employed by the government use oil of catnip as a lure when hunting mountain lions and bobcats.

New species of insects are being found and classified at the rate of 6,000 a year.

PERFECT PHYSICAL RECOVERY OF A FOWL MAY FOLLOW AN ATTACK OF A SEPTICEMIC DISEASE

By B. F. KAUPP and R. S. DEARSTYNE

Laboratory of Poultry Investigations and Pathology

North Carolina Experiment Station, Raleigh, N. C.

The question of the ability of a fowl to withstand a severe onset of a septicemic disease, recover, and be an economic bird to save for breeding and laying purposes is one of much concern. Many birds so affected recover at the expense of body vitality to such an extent as to leave them emaciated, poor feeders, non-layers, and of no breeding or market value. There also exists the fact that among flocks suffering from contagious disease certain birds appear to possess natural immunity to the specific causative organism, and do not contract the disease, even when drinking from the same containers as the sick birds, feeding from the same hoppers, on the same range, and in intimate contact in every way with infected birds. Others have different degrees of resistance, some readily contracting the infective disease and succumbing quickly, while others with greater resistance linger longer before dying.

In the work being conducted at the North Carolina Experiment Station on the septicemic diseases of the domestic fowl, an instance of proven septicemia brought on by artificial infection with the organism of fowl typhoid, which did not prove fatal in the initial host, but proved fatal to another bird was demonstrated. The infecting organism was recovered from the blood current *via* wing vein on the fourth day after infection. Clinically this bird showed no signs of infection, and was discharged from the poultry hospital on the fifteenth day after infection. The organism recovered was used as the infecting agent for another bird, this bird showing acute symptoms of the disease four days after inoculation and succumbing fifteen days after.

The accompanying charts and tabulations give the clinical history of the two birds:

HISTORY OF BIRD "A"

Subject: S. C. Rhode Island Red hen—mature.

Source: Hospital bird.

Condition on infection: Excellent.

Method of infection: 5 cc saline emulsion of a 24-hour, agar-slant growth of Klein's disease (fowl typhoid—State Serum Laboratories, Rotterdam, Holland), given in drinking water at 11:00 a.m., February 12, 1923.

CLINICAL STUDIES

Date	Respiration	Temperature	Laboratory tests
Feb. 7	48	106.4	Test for agglutinins (microscopic) negative at 1-50 and 1-100.
" 10	48	106.0	Test for septicemia—negative.
" 12	5 cc sal. emul. (Klein) fed in drinking water.	107.0	
" 13	49	106.0	
" 14	48	106.5	Test for septicemia—positive.
" 15	44	106.3	
" 16	41	106.2	
" 17	42	106.9	
" 18	42	106.0	Test for septicemia—negative.
" 20	44	106.4	
" 21	42		

BLOOD STUDIES

Date	Cell Counts		Differential			
	Red cells	White cells	Lymph. %	Poly. %	Mono. %	Mast.
Feb. 7	3,588,000	22,000				
" 8	3,188,000	20,000	61	39	1	
" 13	3,084,000	39,000	61	39		
" 15	3,022,000	34,000	73*	25		2
" 20	3,570,000	28,000	65	35		

*Small 67%; large 6%.

PRACTICAL DEDUCTIONS

It is evident that a slight lymphocytosis took place, with a total reduction of the number of red blood cells and an increase of the total number of white blood cells.

AFTER RECOVERY

Bird A was kept in an exhibition cage, 28 by 28, and was fed a laying ration with plenty of green feed. Between the day of discharge and the second day of June this bird laid 32 eggs, estimated as a normal production for the period, under such conditions of confinement as mentioned above, and was still in a laying condition on day of death, which was caused by rupture of liver, a result of concussion due to jumping from cage onto concrete floor.

HISTORY OF BIRD "B"

Subject: S. C. Rhode Island Red pullet.

Source: Central plant.

Condition on infection: Excellent.

Method of infection: 5 cc of a bacillary saline emulsion of

24-hour agar-slant of the organism isolated from the blood current of bird A was given in the drinking water at 4:00 p.m., February 19, 1923.

CLINICAL STUDY

Date	Respiration	Temperature	Remarks
Feb. 18	45	107.0	No septicemia.
" 19	42	106.9	
" 20	41	107.6	
" 21	35	108.0	
" 22	35	109.5	
" 23	35	109.8	Bird dejected, diarrheal dejecta, some blood, sulphurous-colored, watery droppings.
" 24	36	108.6	
" 25	36	109.3	
" 26	34	109.7	
" 27	42	109.9	
" 28	36	109.3	
Mar. 1	38	108.5	
" 2	38	108.4	
" 3	35	108.2	"
" 4	35	108.0	"
" 5	36	107.2	"

AUTOPSY OF BIRD "B"

External appearance: The carcass shows marked emaciation, with pale face, unkempt plumage. There is a soiling of the feathers in the region of the vent, indicating diarrhea.

Liver: Hepatitis is present. The liver weighs 65 grams.

Kidneys: The kidneys show marked active and passive congestion.

Heart: The pericardium is pale. Hydropericardium is present. The heart has a parboiled appearance, with white areas in the myocardium.

Intestines: Both petechiae and ecchymoses of the mucous membrane of the small intestine are present.

MICROSCOPICAL STUDIES

Liver: Cloudy swelling; active and passive congestion is present. There are areas of leucocytic invasion.

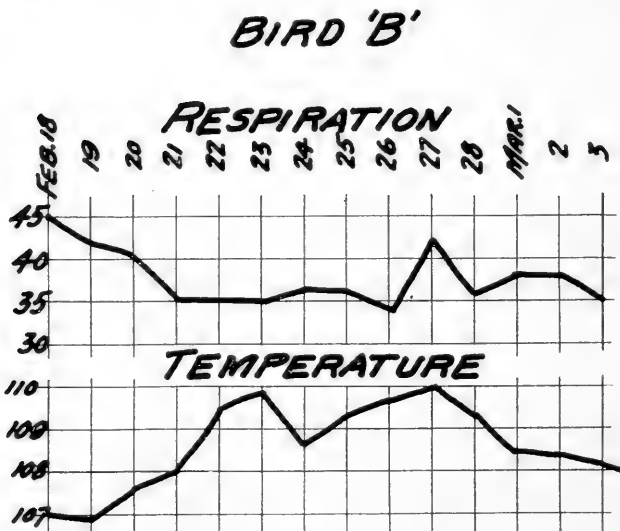
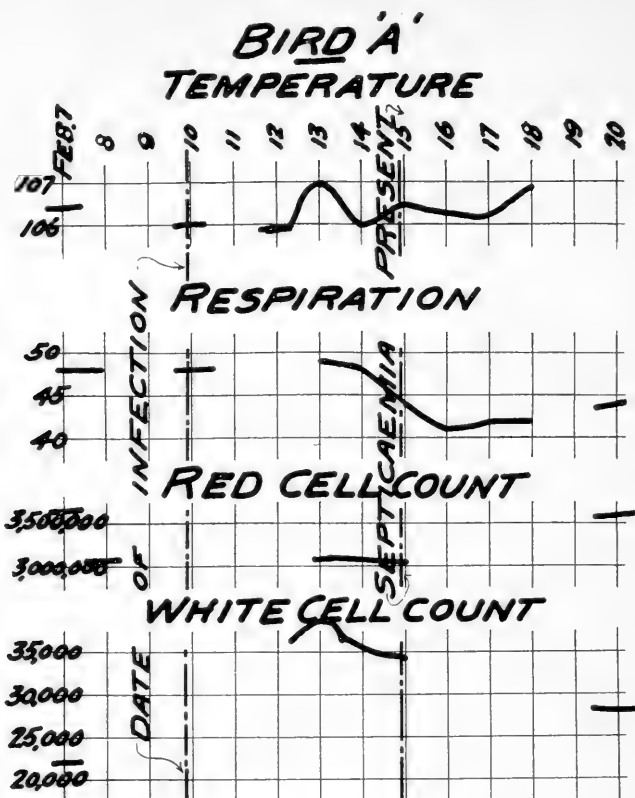
Kidneys: Active and passive congestion is present.

Heart: Myocarditis is present. The sections show various degrees of cellular invasion. The muscle fibers have lost their cross-striation. In many fields the muscle fibers are forced apart by masses of leucocytes.

Bacteriological studies: *Bacterium sanguinarum* is recovered from the heart, spleen, and kidneys. The cultures were identified by carbohydrate reactions and staining characteristics.

SUMMARY

There is given here the record of a case in a Single-Comb Rhode Island Red hen in which an initial septicemia developed, following the feeding in the drinking water of a virulent strain



of *B. sanguinarium*. The hen recovered without showing marked clinical symptoms. That the disease had developed in the hen was shown by the temperature rise, blood study, and the recovery of the organism from the blood of the wing vein.

A second bird inoculated with a culture of the recovered organism developed acute septicemia from which it died, showing typical symptoms, postmortem findings, and microscopic and bacterial confirmations.

The recovered fowl completely regained her former physical powers, as shown by the fact that in confinement on the proper ration she produced a normal, spring-cycle production in eggs.

VISITORS AT THE JOURNAL OFFICE

Among our members who have paid visits to the JOURNAL office during recent months are: Drs. J. D. Stilwell, of Indianapolis, Ind.; J. W. G. Hansen, of Greenville, Mich.; Russell A. Runnells, of East Lansing, Mich.; H. F. Leighton, of Pontiac, Mich.; Joseph Hawkins, S. Brenton, Donald C. Beaver, E. E. Patterson, H. C. Hughes, A. R. Ward, John Hoberg, Robert F. Blatchford and Joseph E. Zeltzer, all of Detroit.

FARM LIVE STOCK VALUES ON DECLINE

The total value of live stock on farms and ranges of the United States on Jan. 1 is estimated by the Department of Agriculture at \$4,912,907,000, a decrease of 266,258,000, or 5.1 per cent, as compared with their value on Jan. 1 a year ago.

Wild horses in the vicinity of Bend, Oregon, have increased so rapidly that they are becoming a nuisance. Extremely low prices for horses resulted in the ranchers turning them out into the mountains to shift for themselves.

Deer imported to New Zealand have become so large in numbers and so destructive to farmers' crops that it has been necessary to place a bounty of two shillings a head on them.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

PURPURA HEMORRHAGICA (PETECHIAL FEVER)

By GEO. E. FETTER, *Hopewell, N. J.*

Having read various reports of this disease in the JOURNAL I thought the following cases might interest our readers.

Case 1: Horse recently purchased from sales stables. Had been driven about ten miles in morning, although fore and hind limbs slightly edematous. On examination in evening found a well-marked case of purpura, temperature 103, increased respiration and pulse, swelling of limbs quite painful, numerous petechial spots in mucous membrane of nose and septum. Horse was given strychnia sulphate *per os* as well as a febrifuge. Second day swellings of limbs somewhat greater, as well as pronounced swelling of nose and nostril appearing. Temperature, pulse and respirations about the same. Third day swellings not so painful but extreme exudation from swellings of limbs. Petechial spots somewhat cleared up in nostrils. Temperature 101.4, pulse weak and respirations much reduced. Febrifuge was discontinued and animal was given strychnia only. Exudate from limbs continued for about three days and complete recovery in ten days, but animal quite emaciated.

Case 2: Horse had just recovered from pneumonia and was placed on strychnia solution to be given *per os*. Caretaker desiring an easy method, put the solution on the oats. Within forty-eight hours was called and found a case of purpura, petechial spots on mucous membrane of nose and septum, edematous swelling of limbs, slight temperature rise. I was tempted to give a hypodermic of strychnia but wished to satisfy myself that animal was not getting the strychnia solution that caretaker had put on the oats, so instructed that the solution be given *per os* and symptoms disappeared within seventy-two hours.

Case 3: Horse recently recovered from mild attack of shipping fever and to my knowledge had not been under treatment. Well marked case of purpura developed and when called found edematous swelling of limbs quite pronounced and painful, petechial spots in mucous membranes of nose and septum.

Temperature 102. Hypodermic injection of strychnia was given. Next morning temperature normal, swelling somewhat reduced and petechial spots not so pronounced. No febrifuge was given. Other injections of strychnia were given twice during the day and on the following day all symptoms had disappeared and animal was placed on strychnia solution to be given *per os* for a few days.

Much quicker and more pronounced results were obtained giving the strychnia hypodermatically in minimum and repeated doses.

Just what does cause purpura? It is my opinion that it is a nerve disease; whether caused by bacterial agents I will not attempt to say, but I believe that the vaso-motor nerves become so weakened that the blood vessels lose their tone and elasticity and hence the diapedesis of the blood corpuscles and serum and resultant petechiae.

INTESTINAL COCCIDIOSIS OF SHEEP

By L. V. SKIDMORE

University of Nebraska, Lincoln, Nebr.

History of the animals—October 11, 1922, the University of Nebraska purchased 300 lambs of Wyoming origin, on the Omaha live stock market for a feeding experiment. These lambs arrived in Lincoln, October 12, 1922, at 5:30 p. m. The following morning they were weighed. The average weight was 57.1 pounds each.

Symptoms—November 5, my attention was called to seven or eight of these lambs which were extremely emaciated and showed an unsteady gait and weakness in walking. Temperatures ranged from 102–105° F. Two of the lambs had diarrhea.

Mortality—Three of the lambs died on the following dates: One died November 19, one died November 22, and one died December 4.

Post-mortem findings—The most conspicuous lesions were found in the small intestines. Here the mucosa was slightly reddened and showed small, unraised, whitish spots, varying in size from a pin-head to a millet seed.

Microscopic findings—Upon microscopic examination it was found that these whitish spots contained masses of coccidia, identified as *Coccidium faurei*, which had invaded the intestinal

wall. Coccidia were also found in the feces of two of the affected lambs.

Treatment—No treatment was given to any of the 300 lambs. Strict sanitary precautions were observed in keeping the feed and water troughs clean. The lambs were fed heavy rations. No further deaths occurred.

DOES POULTRY PRACTICE PAY?¹

By H. C. SMITH, Jesup, Iowa

It may seem strange to the older practitioners to hear one say things relative to the treatment of various diseases of poultry. It may seem that the veterinarian of today, occupied with his treatment of horses, cattle, swine and sheep, has very little time to give poultry practice and diseases much consideration. Yet every day we are asked about this ailment or that trouble by the busy housewife of some good client.

In some cases we have to admit our ignorance while in others we make a snap diagnosis from history. We may have read in the professional journals of some new disease affecting fowls, and we may venture a guess that the trouble in question is the one described. Not all diseases of poultry are readily recognized or diagnosed. Acute cases of fowl cholera, fowl typhoid, bacillary white diarrhea and some nutritional conditions offer slight gross evidence for differentiation. Help in the handling of the flock is certain to be sought by the flock owners. Every encouragement should be given them by the veterinarian to seek the latter's help. Unless help from the veterinarian is forthcoming it will be sought from other sources. Now is the time when veterinarians should be awake and able to treat poultry diseases the same as those of other animals.

Diseases of the mucous membranes of the head and throat, such as chicken pox, ocular roup, and sinus or head roup, which oftentimes occur simultaneously, are probably the most tedious of all diseases of fowls to treat.

I believe that the average practitioner is able to recognize all three of these conditions but oftentimes he does not think he has the time to spend with them. I am sure he can treat these birds in a manner satisfactory to his client, both as to results obtained and money expended.

¹Written while a senior veterinary student, Iowa State College.

A flock of 75 birds, of which I am going to speak, showed all forms of chicken pox. Some showed scab formations on the wattles and combs. Others were affected with ocular roup only, having a swollen eye and in a good many cases the entire orbit filled with a cheese-like exudate which pushed the eyeball completely out of the orbit. In less severe cases the eyelids were swollen and adherent and in milder forms there were photophobia and lachrimation. In those affected with sinus or head roup the principal symptoms were dyspnea and swelling of the head. Production of a sticky, white exudate with a very characteristic odor is common to all forms of roup.

All birds were allowed to run together in a well ventilated pen with plenty of sunlight. Potassium permanganate was placed in the drinking water and changed daily. Each bird was treated individually and at intervals of four days, for a duration of three weeks. Those affected with chicken pox were treated by removing the pox scab by means of a curette and painting with tincture of iodine. Those affected with ocular roup were treated by taking a swab of cotton on a small stick about the size of a match, this was dipped in boric acid solution and used to clean the eye of pus and exudate. Those affected with sinus roup were treated also with boric acid solution, applied into the sinuses, through the roof of the mouth. The nostrils were smeared with salve containing menthol .25, camphor .25, in petrolatum as a vehicle.

In three weeks the birds were allowed to run at large. Ten of the worst affected were lost but this perhaps was due to being affected with all three forms. The hens that were laying before treatment, continued to lay during the treatment and when discharged were still producing. One hen in particular was blind in one eye but continued to produce her daily egg.

Poultry Practice Produces Profits.

Permanent Pastures Perpetuate Parasites.

Pernicious Practices Prostitute a Profession.

Systematic Sanitation Saves Swine.

REVIEWS

MEDICAL AND VETERINARY ENTOMOLOGY. By William B. Herms, Professor of Parasitology, University of California. Second edition, completely revised. 462 pages, with 229 illustrations in the text. The MacMillan Company, New York, 1923.

This work constitutes a textbook to be used in schools and colleges, as well as a handbook for the use of physicians, veterinarians and public health officials. The first edition of this book appeared in 1915, but the rapid growth of our literature on the subject of insects and related organisms, as they affect the public health and animal industry, has made it necessary for the author to rewrite a great deal of the subject matter, in order to keep it anywhere near its original limits. As it is, the new edition contains about 69 pages more than the original.

An historical account of the development of medical entomology has been incorporated, and many of the chapters have been enriched by the experience of the author as an army sanitary officer in the late war. Although the number of illustrations has not been materially increased, a number of those appearing in the first edition have been replaced by new ones.

In the index of authors whose work is referred to in the book, we note the names of many veterinarians, notably Graybill, Hadwen, Hall, Imes, Law, Mayo, Salmon, Underhill, *et al*, and several investigators equally well known for their veterinary investigations, such as Nuttall, Ransom and T. Smith. The frequent references to the original sources of the material in the book make it just that much more valuable.

The book is printed in a very readable type, the etchings from drawings are clear and distinct, but many of the half-tones are rather poor and in marked contrast to others which are very good. On the whole the book is well written and should be found in every veterinarian's library.

MEDECINE ET CHIRURGIE CANINES (Canine Medicine and Surgery). By P.-J. Cadiot and F. Breton. 4th edition. xi-420 pages, with 72 figures in the text. Asselin and Houzeau, Paris, 1924. Price, 20 francs.

This is a new edition of a book, former editions of which have met with a warm reception—both by students and practitioners

—all over the world. The tremendous growth in small animal practice and the intense interest being manifested in canine medicine and surgery contribute to make the appearance of this new edition very timely.

The authors have adhered to the general plan of previous editions, and in the addition of new matter they have been very careful to include only those new treatments or methods which have "stood the light," or of which there has been demonstrated proof of their efficacy or their superiority over the old.

Among the new subjects treated are: Tumors of the anal region, renal eustrongylosis, retention and incontinence of urine, retained placenta, leishmaniosis, irido-cyclitis, irido-choroiditis, retinitis and atrophy of the optic nerve, and caudal tenectomy.

Under infectious diseases, the authors first discuss distemper, half of the space allotted being given to treatment. The authors recognize a contagious broncho-pneumonia of the dog, and the disease is quite similar to distemper, clinically. They state that "the absence of the eruption is the principal differential sign." This is not in agreement with American authorities, who state that the cutaneous eruption may be absent in a great many cases of distemper. The authors are not very enthusiastic over prophylactic vaccination. They say: "Whatever is the nature of the infection, attention to hygiene and dietetics is of the utmost importance."

It is interesting to note that almost twice as much space is given to tuberculosis of the dog as to distemper, indicating the growing importance of the former infection.

ABSTRACTS

THE NOMENCLATURE OF THE MELITENSIS-ABORTUS GROUP OF BACTERIAL ORGANISMS. SEROLOGICAL CLASSIFICATION OF BRUCELLA MELITENSIS FROM HUMAN, BOVINE, CAPRINE, PORCINE AND EQUINE SOURCES. Alice C. Evans. Reprint No. 861 from the Public Health Reports of the U. S. Public Health Service, Washington, D. C.

Miss Evans has made a critical study of the various names assigned to the abortion and melitensis group of bacteria. She has also received the aid of Dr. C. W. Stiles, of the Hygienic Laboratory, in respect to the principles of Linnean nomenclature. As a result of these studies, she has determined that the proper name for this group, including both melitensis and abortion

bacteria, is *Brucella melitensis*. As a result of serological data, the writer has shown that strains of human, bovine, caprine, porcine and equine origin cannot be distinguished by the simple agglutination test. By the agglutinin-absorption test, these strains fall into distinct serological types which may be considered as varieties or subspecies. One may be designated as the *Brucella melitensis abortus* variety which includes the majority of bovine and porcine strains. The serological types, which consist chiefly of strains from human and caprine sources, may be designated as *Brucella melitensis melitensis*. It is also stated that a number of other species should probably be classed in this genus.

Miss Evans has also carried on a continuation of her work of 1918, when she pointed out that the causative organism of Malta fever and that of contagious abortion in cattle are closely related in their morphological, cultural, biochemical, serological and pathogenic characteristics. This work has been confirmed by Meyer and his associates in this country, by Zeller, Jaffé and Skaric in Europe, by Khaled in Egypt, and by Burnet in Tunisia. In this last study Miss Evans worked with forty-nine strains of *Brucella melitensis*. These strains came from various sources, some from cattle, swine, goats, horses and humans. They came not only from this country, but from various European sources. The author's studies consisted of an attempt to differentiate these strains by means of the agglutinin absorption tests. As a result of this study the following conclusions remain:

(1) "This species may be differentiated into at least seven serological groups. Four of these groups included only one or two strains each, and were relatively unimportant.

(2) "The majority of bovine and porcine strains fell into one large group (30 strains), which is designated variety *abortus*. Two strains of human origin were of this variety. Two of the small serological groups are so closely related to this one that they should be considered as subvarieties. One of these includes only one strain of bovine origin; the other includes two strains, both of human origin.

(3) "Another important group includes strains of human, bovine, caprine, and equine origins (11 strains). It is designated variety *melitensis A*.

(4) "A third group of three strains characterized morphologically by a predominance of coccoid cells assumes importance from the evidence that this was the variety that Bruce was working with when he named his newly discovered organism "*Micrococcus melitensis*." It is designated variety *melitensis B*.

"Simple agglutination tests can not differentiate between varieties *abortus* and *melitensis A*. These two varieties can be differentiated from *melitensis B*, by the simple agglutination test only when the titer of the serum used is accurately known for the several varieties."

There can be no question but that the germ causes abortion in animals and that causing Malta fever in man are very closely

related. The exact bearing that this has on human health has not yet been determined. It should be kept carefully in mind, however, and further experiments will demonstrate the exact significance.

C. P. F.

STUDIES IN VACCINAL IMMUNITY TOWARDS DISEASE OF THE BOVINE PLACENTA DUE TO *BACILLUS ABORTUS* (Infectious Abortion). Theobald Smith and Ralph B. Little. Monograph of the Rockefeller Institute for Medical Research, No. 19, November 15, 1923.

This is a completed report of work carried on at the Rockefeller Institute for the Study of Animal Diseases, at Princeton, New Jersey, for a period of five years, on the question of the production of immunity. Living cultures and cultures killed by heat have been employed in this work.

Two experiments have been carried out.

1. "In one experiment, comprising 134 control and 53 vaccinated heifers, the abortion rate, following vaccination with living cultures, was 16.7 and 11 per cent respectively for first and second pregnancies, as compared with 25.1 and 19.2 per cent for the control groups.

"In a second experiment, comprising 35 heifers treated with heated cultures and 10 with living cultures, the combined abortion rate for the first pregnancy was 14.7 per cent as compared with 41.6 per cent for 38 controls. The rate for the 10 treated with living cultures was 0. The above estimates do not include those cases in which full-term pregnancies were associated with infected or diseased placentas."

The authors also state that living cultures should be used only in herds in which abortions in the first pregnancy are common. They were not able to determine the relative efficiency and danger of recently isolated strains of *Bacillus abortus* and those cultivated for several months or years. They believe, however, that the older cultures should be employed in the preparation of the vaccine. No gain seems to be had in two injections of living vaccines. Several cases of abortion due to *Vibrio fetus* were determined in their studies.

"The use of vaccines does not in itself tend to eliminate the infectious agent from any herd, although it may greatly reduce the infectious material quantitatively by reducing the number of cases of placental disease.

"Animals treated with living virus should not be herded with the unvaccinated unless the latter have passed through the disease or have a high agglutinin titer.

"Cultures of *Bacillus abortus* exposed to the lowest temperature which will kill all bacilli and injected repeatedly may produce a relatively high degree of resistance."

This publication is an extensive one (124 pages) and should be carefully read by all those interested or concerned with the problem of abortion disease.

C. P. F.

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of Sixtieth Annual Meeting, Montreal,
Canada. August 27 to 31, 1923.

(Continued from p. 507, January Journal)

THURSDAY MORNING, AUGUST 30, 1923

The meeting convened at 9:30, President Welch presiding.

PRESIDENT WELCH: We will listen to a further report of the Executive Board.

DR. WAY: Mr. President and Gentlemen: At a meeting of the Executive Board in Chicago, some two years ago, a representative of a local association appeared before the Board (he was not a member of our Association) and endeavored to present a very radical and revolutionary change to the constitution and by-laws of this Association.

A year ago, at the meeting of the Executive Board in Chicago, some of the members of the Board recognized a general feeling of unrest, not only in our Association, but generally throughout the country.

The Secretary of our Association had asked for a definite statement of policy, which he might carry to the various state and local associations, and, in view of the demand or the need for some such declaration on the part of this Association, one of the members of the Executive Board presented a resolution calling attention to the fact that this was highly desirable, and suggested the appointment of a committee.

Our good President was sitting with us at that meeting of the Board, and, in conference with him, the Chairman of the Board appointed a committee, which was a committee of the Executive Board, to study the question and prepare something that this Board might officially present to you. The Committee worked for about six months.

The various subjects that were considered were allotted to different members of the Committee, each man preparing a statement that he considered would be advisable to accept or to adopt as a policy. The various statements were assembled by the Chairman, and typed and re-distributed to every member of the Committee.

Several meetings have been held since the middle of July, and, after hours of discussion and the burning of much midnight

oil at this meeting, the Executive Board is pleased to present, in as clear-cut and as definite a form as it seems possible, its recommendation for a policy that may be adopted by this Association.

. . . Dr. Way read the proposed policy. (Published in JOURNAL, December, 1923.) . . .

DR. WAY: Mr. President, I move the adoption of this policy.

. . . Seconded by Dr. Mayo . . .

DR. CARY: I want to ask for information regarding the establishment of those committees. Are those special committees or permanent committees?

DR. WAY: Permanent committees.

DR. CARY: We have no authority for establishing permanent committees without bringing in an amendment to the constitution and by-laws. We cannot accept a report of that kind except for special committees.

PRESIDENT WELCH: The point is well taken, Dr. Cary.

DR. MAYO: This is a rather typical Yankee report. I don't mean necessarily from New England, but made that distinction to separate us from the Canadians.

South of the line we have a penchant now for regulating every phase of human activity. We are going to legislate you good whether you want to be good or not. We have got a fad for legislation, and this is really legislation.

Now, I want to say that I approve this in its general plan; I believe that the Association should have a pretty-well-established policy, but I seriously question, Mr. President, whether they ought to go into detail as to how all of these policies should be carried out; at least, without further consideration than we have given it so far. I had a little to do in conference with some part of this, with reference to the veterinary biologics. It is just as logical to take veterinary pharmaceuticals.

The point is that I think the policy should be general. We can get the details afterwards. I think that this whole plan, before it is adopted, should be published in the JOURNAL. Now, it is pretty good. I am not knocking. I like the whole thing pretty well. I am naturally good myself (laughter), and it doesn't make much difference to me, but I really think it would be better to postpone definite action on this for another year. I know the Committee has done some hard work on this, but it is very wide-reaching in its influence. It is a very expensive proposition, and, for instance, take the question of county

veterinarians or district veterinarians: I don't know whether the policy on that is going to be right. It looks that way now, but I certainly would like to give that a good deal more consideration before we vote on it.

Mr. President, I move that the policy as presented be published in the JOURNAL and laid upon the table for one year.

The motion was seconded by Dr. Kinsley and Dr. Cary

PRESIDENT WELCH: It is moved and seconded that the report of this Committee be published in the JOURNAL and lie on the table for one year. Are you ready for the question?

DR. FERNEYHOUGH: I want to see if I understand this. I understood him to second the motion.

DR. MAYO: In order to get that report before the house, a motion had to be made and seconded to adopt it.

Now, this motion is to lay it on the table for a year, which is in order, but with that, I coupled the idea of having it published in the JOURNAL, so that all members can have a chance to study it.

DR. W. L. WILLIAMS: I raise a point of order. The motion before the house is not open for discussion, a motion to lay on the table.

PRESIDENT WELCH: A motion was made and seconded that the report be published and lay on the table for one year. All in favor, say "aye," opposed, "no." I am unable to decide.

A rising vote was had, and the motion was carried, 38 to 28. . . .

DR. MAYO: Mr. President, may I rise to a question of privilege? I don't want the impression to go out that I am opposed to this. There were some who seemed to think I was. I am rather in favor of it, but we want to get the practitioner interested in this just as much as possible, and I want to give him a chance to express his opinion, not only through the year, in the JOURNAL, but next year when this will come up for final adoption.

DR. CARY: I would like to say a word. I am not opposed to these committees, or the formation of the committees, but I don't think we ought to hop up here and establish a permanent committee, by a motion, to go into effect for years, without considering an amendment of the Constitution. This Association has no right to establish a permanent committee, without an amendment to the constitution and by-laws. It is time we are getting in the habit of following the constitution and by-

laws or doing away with them. If, every time we want to do something, we get up here and say we want to do something by motion and do it regularly, we will get to be the laughing-stock of other associations*and everybody else.

I am not saying I am fighting this thing. I am in favor of a great majority of the things presented there, and I will vote for it if the committee is established rightly, but I don't think the Executive Committee has a right to get up here and violate the constitution and by-laws.

DR. WAY: I might have misunderstood Dr. Cary's original question. The thought of the Executive Board in this recommendation is to create a committee that will be permanent in character, and workable from year to year, so that questions of policy may be referred to the proper committee, and that questions pertaining to veterinary biologics may be thrashed out with the Bureau of Animal Industry which regulates those products and the manufacturers who manufacture them.

PRESIDENT WELCH: Gentlemen, we will proceed to the regular program. The first on the program will be "The Practitioner as the Foundation of Veterinary Service," by Dr. E. R. Steel, Grundy Center, Iowa. (Applause.)

. . . Dr. Steel presented his prepared paper. (Published in the JOURNAL, October, 1923.) . . .

PRESIDENT WELCH: We will pass on to the next part of the program which is "Some Laboratory Findings and Conclusions Regarding the Bang Abortion Organism which Puzzle Clinicians," by Dr. W. L. Williams, of Ithaca, N. Y. (Applause.)

. . . Dr. Williams presented his prepared paper. (Published in the Journal, November, 1923.) . . .

PRESIDENT WELCH: The next on the program is "The Challenge to the Veterinary Profession," by Professor H. Barton and Dr. Conklin. Professor Barton is unavoidably absent this morning.

. . . Dr. Conklin read the prepared paper. (Published in the JOURNAL, December, 1923.) . . .

PRESIDENT WELCH: Is there any discussion? If not, at this time I want to grant the Chairman of the Revision Committee a chance to make a motion to take up a matter that was left unfinished. There is a motion before the house to recommit the report of the Committee on the Revision of the Constitution and By-laws to the Executive Board for further consideration. That motion is before you. The motion is ready for discussion.

DR. McLEOD: I believe that was very satisfactory to the Committee on Revision. It will expedite matters if the Committee can report their findings and recommendations tomorrow.

PRESIDENT WELCH: Are you ready for the question?

. Calls for question

. The motion was carried

PRESIDENT WELCH: Gentlemen, what is your pleasure? It is ten after twelve, and we are billed to leave the Grand Trunk Station at one p. m.

. It was voted, on motion of Dr. McLeod, duly seconded, that the meeting adjourn.

. The meeting adjourned at 12:10

ADJOURNMENT

FRIDAY AFTERNOON, AUGUST 31, 1923

The meeting convened at 2:00 p.m., President Welch presiding.

PRESIDENT WELCH: The first thing on the program will be a report from the Executive Board.

DR. KIERNAN: Mr. President, during the absence of the Secretary, I want to make a recommendation of the Executive Board. It is recommended that Dr. Hoskins' salary be increased to five thousand dollars per annum, beginning October first, 1923. The Board commends the very satisfactory service rendered by Dr. Hoskins, and also recommends that he be instructed to take a two-weeks vacation at his convenience.

I move that the recommendation be adopted by the Association.

. The motion was seconded by Dr. Faust and carried

* * * *

SECRETARY HOSKINS: The following applications for membership have been approved by the Executive Board. (Read the list.)

PRESIDENT WELCH: What shall be done with the applications?

DR. MAYO: Mr. President, I move that the applicants whose names were read be elected to membership in the Association, and the Secretary be instructed to cast the ballot of the Association for them, if in order.

. The motion was seconded by Dr. Faust, and carried

SECRETARY HOSKINS: We have some resignations which require action. The following members have tendered their

resignations during the past year. These resignations have been presented to the Executive Board, and the Executive Board has recommended them to the Association for acceptance.

Baker, S. S., c/o Standard Biscuit Co., Des Moines, Iowa.

Boyce, Nelson V., 610 Sandusky Ave., Kansas City, Kans.

Brouse, Stanley C., R. F. D. No. 13, Dayton, Ohio.

Carl, L. W., 1128 Wyandotte Road, Columbus, Ohio.

Fabian, Arthur E. H., 421 Walworth St., Lake Geneva, Wis.

Gain, J. H., Francois Lake, B. C., Canada.

Kampschmidt, Frank L., 1172 West 39th Pl., Los Angeles, Calif.

Kirch, Lawrence P., 315 Sanders St., Indianapolis, Ind.

Meenen, P. J., Fremont, Nebr.

Paul, A. F., Jr., 3421 Dent Pl. N. W., Washington, D. C.

Schneider, Ernest, Kulm, No. Dak.

Stanley, Carl B., Bellville, Ohio.

Starr, G. H., Norris City, Ill.

Weeks, Burgess E., Consecon, Ont., Canada.

Welsh, Mark F., College Park, Maryland.

Whiteman H. J., 1301 Ligonier, Latrobe, Pa.

Wilbur, Bert Raymond, Randolph, N. Y.

Winter, John H., Meadville, Pa.

I might add, at this time, that in the majority of cases these resignations are being tendered on account of change in occupation. In a few cases it was a case of financial stringency, and in several cases no reasons were given and none could be obtained.

PRESIDENT WELCH: A motion to accept these resignations is in order.

It was voted, on motion of Dr. Kiernan, duly seconded by Dr. Mayo, that these resignations be accepted, as recommended by the Board . . .

SECRETARY HOSKINS: Several other matters: The Secretary was instructed to get a public accountant to examine his accounts, as of October 1, 1923, which will be one year from the time that the office was taken over. The report of the accountant is to be presented to the Executive Board, at the meeting in Chicago, in December.

The Executive Board considered the amendments which have been offered, with the following action: The report of the Committee on Revision of Constitution and By-laws was read, and it was voted, on motion by Dr. Munce, seconded by Dr. Stange, that the report of the Committee be received. It was voted on motion, duly seconded, that the amendments be read.

Secretary Hoskins read the amendments . . .

DR. CARY: Mr. Chairman, owing to the fact that there has been some question of the legality of the presentation of these amendments, it has been agreed on by a number that it would be best to lay these on the table, and have all these propositions lie over for another year.

Therefore, I move that this recommendation be laid on the table.

. . . . The motion was seconded by Dr. Munce

DR. MAYO: If this is to be considered official, notice of a change of constitution must be given.

DR. CARY: Give official notice later.

. . . . The motion was carried

DR. CARY: Mr. President, I hereby introduce the proposed amendments, as published in the March, 1922, issue of the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, to take the regular course and be presented by the Executive Board for adoption or rejection at the next regular meeting of the American Veterinary Medical Association.

These are printed; they are fixed in printed form as reported, and they are to be printed again next year as another notice, by the Secretary. I introduce this.

. . . . The motion was seconded by Dr. Munce, and carried

DR. CARY: I move that a committee of five members be appointed to be known as a special committee on Revision of the Constitution and By-laws to report at the next regular meeting of the American Veterinary Medical Association.

. . . . The motion was seconded by Dr. Munce

DR. STANGE: May I ask for a little information here? I wonder, Dr. Cary, if it would be well for that committee to report to, or work with, the Executive Board, so the thing may be in shape for action.

DR. CARY: They will have to work with the Executive Board, as provided in the previous motion.

DR. STANGE: I understood at the next meeting. I think the Executive Board ought to have this before the next meeting.

DR. CARY: They will have.

DR. STANGE: The Executive Board would have time to go over this matter and have it in good shape for action at the next meeting. That was my point, Mr. Chairman.

DR. CARY: That is the custom, and it always must go through the Executive Board, the same as it has always been. We can have it stated in there if you want it.

DR. STANGE: My only point was that I would like to see the whole matter in good shape for action next year. I thought if they would report to the Executive Board and the Executive Board could go through this, it would be ready for action.

DR. CARY: Make that as an amendment, and I will accept it.

DR. STANGE: I will make that amendment.

DR. CARY: I will second the amendment that they report to the Executive Board.

. . . The vote was taken on the amendment, and it was carried . . .

. . . The question was then put on the motion as amended, and that also was carried . . .

SECRETARY HOSKINS: It is proposed that Article 17, Section 1, be amended by changing the word "audit" to "policy" and add "veterinary biologics." This is merely the formal notice to provide for the two committees which are proposed in the report of the Committee on Policy.

DR. MAYO: Mr. President, I move that this be received and referred to the Committee on Revision of Constitution.

. . . The motion was seconded by Dr. Cary. . . .

PRESIDENT WELCH: All amendments have to be referred to the Executive Board.

DR. MAYO: My understanding was this committee has to refer to the Executive Board later, and it will of necessity go there. It was only to facilitate the work of getting it in shape that I moved to refer it to that committee.

SECRETARY HOSKINS: There is nothing to prevent its being referred to both.

. . . The motion was seconded . . .

DR. MAYO: Mr. President, I will change that, if it is desirable, to read "to the Executive Board and the Committee on Revision of the Constitution and By-laws."

DR. CARY: I will accept that.

. . . The motion was carried . . .

PRESIDENT WELCH: The next, gentlemen, is the report of the International Committee on Bovine Tuberculosis. Dr. Kiernan.

. . . Dr. Kiernan read the report of the Committee (Applause.) . . .

. . . It was voted, on motion by Dr. Mayo, seconded by Dr. Munce, that the report of the Committee on Bovine Tuberculosis be received and referred to the Executive Board . . .

REPORT OF INTERNATIONAL COMMITTEE ON TUBERCULOSIS

Your committee continued to make studies of animal tuberculosis during the past year and has the honor to submit for your consideration this brief report which is confined principally to the cooperative campaigns that are

being conducted in the Dominion of Canada and the United States for the control and suppression of the disease.

Active campaigns are being carried on in both countries. The main feature of the work is the gradual expansion of the area plan. This plan has proved both effectual, as far as eradicating the disease from the live stock in a given area, and popular with the live stock owners because it reduces the danger of reinfection in the herd by removing the cause from all the herds in the area rather than the cleaning up of individual herds which are left in close proximity to infected ones, and because it may be conducted at less expense. The controlling feature in the eradication campaign is a financial one. Wherever indemnity is paid for condemned tuberculous animals, the work is limited by the size of the funds made available for that purpose each year. It becomes necessary, at times, to suspend operation on account of the exhaustion of indemnity appropriations.

MODIFIED ACCREDITED AREA

The outstanding event of the campaign during the past year was the creation of what is known as modified accredited areas: free of cattle tuberculosis. This method was inaugurated by the United States Live Stock Sanitary Association, which recommended to the Secretary of Agriculture of the United States that such a plan be adopted. On July 23, 1923, an amendment was made to the federal regulations having to do with the eradication of cattle tuberculosis, in which provision was made for classifying certain areas where the disease had been practically eliminated as modified accredited areas. As a result of this action by the Department, these areas will be recognized and will be freed of certain inhibitions which are necessary in other territories. The regulations will be carried out by the Bureau of Animal Industry in cooperation with live stock sanitary authorities. The states will maintain quarantines to protect the designated areas from the introduction of untested animals from other states.

Under the amended provisions, a county may be designated as a modified accredited area when a complete test of all the cattle in the area shows less than one-half of one per cent to be reactors. These herds in which infected animals are found will be quarantined and cannot be retested in less than 60 days from the date of original test. Once an area is put into this modified accredited classification no cattle can be brought in (except for slaughter and steers for feeding purposes) unless from an accredited herd or after having passed a satisfactory tuberculin test applied by a qualified approved or accredited veterinarian.

When an area is designated by the cooperating state and federal authorities as modified accredited area, it will remain so classified for three years, providing there are no indications, through animals slaughtered or in other ways, that the percentage of tuberculosis does not exceed one-half of one percent at any time. If it is found that one per cent or more of the cattle in an area are found to react, then all cattle must be retested. If the infection is between one-half of one per cent and one per cent, then only the infected herds must be retested, and when their percentage of reactors is reduced to not more than one per cent, the area may be classified as a modified accredited area. The first list of counties to be placed in the modified accredited areas contained seventeen, located in four states.

STATE WIDE ERADICATION

Another noteworthy movement of eradication of bovine tuberculosis that occurred during the past year was the issuing of an order by the Louisiana State Board of Health requiring the annual tuberculin testing of all dairy cattle from which milk is sold for human consumption. These are the first state-wide, tuberculosis-eradication movements inaugurated in the United States. It will be observed with great interest because it is a demonstration as to whether or not it is possible to organize a force of sufficient size to apply the tuberculin test to all of the cattle in a state within a reasonable length of time.

NEW YORK SUPREME COURT DECISION

Another incident of importance was the decision rendered by the Supreme Court in New York State on the validity of a city milk ordinance requiring the tuberculin test. An excerpt from the decision is as follows:

"Morschauer, J.: The question for determination is the regulation of the board of health passed July 20, 1920, taking effect May 1, 1921. The Board of Health of the city of Poughkeepsie on July 20, 1920, made and published a regulation that, in effect, prohibits the sale of any milk in Poughkeepsie, except what is designated Grade-A-Raw and certified milk, unless the same is pasteurized.

Some of the fatal diseases known to be conveyed by milk are typhoid fever, malaria, scarlet fever, tuberculosis, diphtheria, septic sore throat, diarrhea and enteritis. In order to guard against the introduction of disease germs into the milk, provision is made for the inspection of dairies and the tests of the cows for tuberculosis."

"Certified Milk—Cows must be tuberculin tested once during previous year and reactors excluded; farms must be scored not less than 35 per cent for equipment and 50 per cent for methods; employees must be examined by physicians; milkers to wear washable suits, not worn at other times; bacterial count not more than 10,000 bacteria per cubic centimeter.

Grade-A-Raw—Cows must be tuberculin tested once during the previous year and reactors excluded; farms must be scored not less than 25 per cent for equipment and not less than 50 per cent for methods; milk must not contain more than 60,000 bacteria per cubic centimeter.

The Board of Health had power to make the regulation. Section 2-b of the public health law (Consol. Laws, c.45) gives the public health council of the State Department of Health power to establish a sanitary code, which shall have the force and effect of law.

The sanitary code was designed to protect the public health and should receive at the hands of the court a liberal interpretation. *People v. Frudenberg* (209 N. Y. 218; 103 N. E. 166).

The learned counsel for the realtor stated at the hearing at different times that the milk dealers would suffer great loss of property by the regulation and they would have to discontinue their business. The answer to all this is that when it becomes necessary for the health, safety and welfare of the community, individual rights must give way. Courts will uphold the actions of public bodies when they perform their duties within the law, even though such actions may be in restraint of trade or may interfere with business interests. The rights, safety and welfare of the community are paramount to that of individuals engaged in a business that might place in danger the lives of its citizens."

In conclusion, the committee takes great pride in reporting that the live stock owners, both in the Dominion of Canada and the United States, have a very high regard for the good work that the veterinarians are performing in eliminating tuberculosis from their herds and preventing the spread of the infection to healthy herds.

PRESIDENT WELCH: The report of the Committee on Abortion.

DR. STANGE: May I present a little matter at this time? I have a little matter here which was brought up at the St. Louis meeting. I presented an amendment to the Constitution and By-laws, relative to membership in the American Veterinary Medical Association. The notice was to amend Article 1, Section 3, to read, "The members of this Association shall be of three kinds, active, honorary and junior."

Now, in explanation, I might say that my idea was to provide a junior membership in the American Veterinary Medical Association which could take in students in veterinary schools. They would not be active members, nor honorary members, but junior members, and we could get the American Veterinary Medical Association work started among the students while they were still in school.

The details of this would have to be worked out. There is a provision in the constitution and by-laws, now, that the Executive Board shall make such regulations as are necessary to carry the constitution and by-laws into effect.

I believe we might still provide for the junior membership and work out the details this coming year. It will automatically go to this Revision Committee as part of the constitution and by-laws, if it is adopted, and the details can be worked in next year.

My idea is this: That we have our veterinary schools help the Association. Now they graduate them, allow them to go away and locate, and then we go out and try to get them into the American Veterinary Medical Association. It seems to me the best way to get those boys interested is to show some interest in them while they are in college and get them interested in the American Veterinary Medical Association, and then it will be much easier for them and us to go right on as members in the Association.

That was the idea in offering this amendment. It was offered in St. Louis, and I move its adoption at this time.

The motion was seconded by Dr. Kiernan, and carried

PRESIDENT WELCH: Now the Committee on Abortion.

In the absence of Dr. Fitch, Dr. Giltner read the report

DR. MAYO: Mr. President, I move that the report be received and referred to the Executive Board.

The motion was seconded

DR. SAVAGE: Mr. Chairman, if I may be permitted, I should like to move an amendment to this effect: That the Committee on Abortion be discontinued, and, speaking to that amendment, there are one or two things which I think it is desirable to say.

DR. W. L. WILLIAMS: I will second the amendment.

DR. SAVAGE: Speaking to the amendment, Mr. Chairman, in spite of the fact that I have conferred with a number of the Committee on this subject, there are one or two things it seems to me should be said.

To begin with, it seems obvious that no committee can possibly control abortion. For that reason, it appears that the Committee has been given an impossible task.

In the second place, I doubt very much if this Committee, or any other like it, can even unify public opinion with regard to such a highly contentious subject, and, in the third place, as the Committee is not essentially a research committee, I fail to see how they can report definite findings with unanimity. It seems that in the past they have considered the results of others,

and that their results have been more or less of a compromise of their various personal opinions and interpretations.

PRESIDENT WELCH: Any further remarks?

DR. W. L. WILLIAMS: Mr. President and Gentlemen: It appears to me, as Dr. Savage has presented the matter, that the Committee is given a task which it is impossible to perform. If the president selects a number of men who have definite opinions upon the subject of abortion, and they come in to the Committee, it is impossible for them to agree upon the scientific facts and conclusions they have to consider. The result is that a compromised report is made, which does not truly state the opinion of any one man upon that Committee. It seems to me that the task which has been assigned to this Committee is one which is absolutely out of the ability of any committee, however it be formed.

The discontinuance of this Committee will not disturb the study of abortion; it will not delay it. It is a committee which was created upon a motion, and can be terminated by a motion, and for that matter could be terminated without a motion at the discretion of the president, I think, and it can be renewed at any time that we have any particular question which a committee might properly consider.

For instance, there is now a movement, as I understand it, in some states, to quarantine against animals for abortion upon the agglutination test. If it is attempted to enforce those laws, then a committee might well consider what we may mean by reaction to the agglutination test, whether it be a titre of one to twenty-five or one to fifty or one to a hundred, and they might define what we mean by a given statement, and to that we could all agree, a compromise, it is true, but if the statement were then made that a certain animal reacted, we would know that the blood agglutinated at the point upon which we had agreed.

But, aside from that, I do not see the necessity for expending the effort and for having men place themselves in a position where the committee reports one thing and where the men outside of the committee say another. It is very trying for a man to do that. Yet there is no escape for him. No matter how tactful a man is, he must say one thing in the committee and something else outside of the committee; otherwise it could not be a uniform report.

We are paying, as I understand it, about five hundred dollars

per annum for supporting the traveling expenditures of this Abortion Committee. I may be far afield in that estimation, but I think that is about it. It seems to me we might be a trifle more economic until we see that we need the services of the Committee in establishing some precedent or some general designation of what we mean by a given term or that they can perform some other service which is of real value to the Association.

PRESIDENT WELCH: Any further remarks?

DR. WATSON: I am rather alarmed at the thought that the Committee on Abortion should be discontinued. Personally, I have found it of the greatest use in my laboratory work and in answering questions pertaining to contagious abortion. As Dr. Savage has said, the literature on this subject is immense. It is scarcely possible for a busy man to collect, coordinate and interpret all the literature that is written from day to day on contagious abortion, and I believe this Committee which is appointed is in much better position to collect that literature and interpret it, and the findings of all these research men, to coordinate it and give us the result, especially when it is criticized and digested and turned over by a committee of four or five than it is for individuals.

As I say, the literature is so immense, I think, for that purpose alone, if the Committee coordinates the literature and gives us its views of the status and the progress that has been made in dealing with contagious abortion in every respect, that alone justifies it.

DR. SCHROEDER: As a member of the Committee I want to make sure I did not misunderstand Professor Williams in one remark he made. That is, members of the Committee say one thing in their reports, and in private conversation say things of a different nature. Did I misunderstand you?

DR. WILLIAMS: Mr. President, Dr. Schroeder understood me correctly. My judgment is that there has to be a compromise and an average opinion given upon given points in the committee, and that that opinion specified by the committee as a body does not accurately represent the views of any member of it.

PRESIDENT WELCH: Any further remarks? If not, the question is upon the amendment that this committee be discontinued. All those in favor of the motion, signify by saying "aye;" opposed, "no." The amendment is lost.

The motion is that the report be received and referred to the Executive Board. The motion is carried.

REPORT OF COMMITTEE ON ABORTION

Your Committee has had two meetings during the year, at which all questions pertaining to bovine infectious abortion were carefully discussed. It was found during the discussions that nothing radically new or of real importance has been discovered since the last report of the Abortion Committee was presented that could be added to previous reports or that makes a revision of the statements made in previous reports necessary.

The very nature of bovine infectious abortion is such that the rapid acquisition of knowledge regarding it cannot be expected, and your Committee while it recognizes the great importance of placing every newly discovered fact before the Association without delay, together with the significance it may have, does not believe that it is desirable to present a lengthy report unless it can impart something that may have real value in the sense that it is something which has not become generally known or in the sense that it is serviceable for the rectification of existing beliefs.

Owing to the great importance of bovine infectious abortion your Committee recommends that a committee on the subject be kept in existence, particularly as many investigations are now in progress or have been planned, the results of which, as soon as they are available, should be reported to the Association.

(Signed) J. F. DEVINE
E. C. SCHROEDER
A. EICHORN
WARD GILTNER

Next is the report of the Committee on Prevention and Control of Animal Diseases.

. . . Dr. Turner read the report . . . (Applause.)

DR. KIERNAN: I move that the report be accepted and the Committee be continued. (Report will be published in March issue.)

. . . The motion was seconded by Dr. Watson . . .

PRESIDENT WELCH All in favor of receiving this report and continuing the Committee, signify by saying "aye;" opposed, "no." The motion is carried.

The report of the Horse Association of America. Is Dr. Muldoon here? (Not present.)

Report of the Committee on Intelligence and Education.

. . . Dr. Goss presented the report . . . (Applause.)

DR. MAYO: I move that the report be received and referred to the Executive Board.

. . . The motion was seconded by Dr. Schroeder . . .

DR. MAYO: There is one point in this report that is new and, I think, very suggestive, and that is the feeling of the Committee that those members of this Association who are teaching in schools not recognized by the Association should be considered unethical.

Now, I was in hope that the Committee would put that in the form of one of their recommendations, because I think it

would be an important factor in either bringing them into line or at least conveying to the students who go there some idea of the standing of those who are supposed to give the instruction.

Unfortunately, in many instances in the past at least, students have gone to an institution that was not recognized by this Association, and they didn't know it, sometimes, until after they had been there a year or two. It is a very unfortunate situation, and it works a great hardship on some students. I would like to see this put in a way so that we can notify those members of ours who are teaching in these schools that unless they discontinue, charges would be brought against them.

DR. FERGUSON: I believe in referring that to the Executive Board, the Executive Board will take care of that part of it.

DR. V. A. MOORE: It seems to me there is some danger in this matter. We have, as I see it, no control over the curricula that are followed in agricultural colleges. If an agricultural college wants to have a department of veterinary science, including hygiene and anatomy, I don't see that is any concern of this Association, and if those students who take those courses apply to regular veterinary colleges where they are to receive a degree in veterinary medicine, and ask for a time credit for the courses that they have taken in the agricultural college, then it becomes a matter for this Association, but so long as an agricultural college wants to teach anatomy, physiology, bacteriology or hygiene or any of those subjects, basic sciences which go to form a veterinary curriculum, and also perhaps an official curriculum, I don't believe that it is a matter for this Association to take up.

PRESIDENT WELCH: Any further remarks?

DR. MAYO: If Dr. Moore thought I said agricultural colleges, I misspoke myself. I referred particularly to veterinary colleges that are not on the accredited list. May I say a word more?

It is rather a delicate subject, and I don't know that we can do anything now, but what I wanted to get into the proceedings of this Association, so that these men would see it and read it, would be the expression of opinion of this Association that it wasn't ethical. I think that some of them would appreciate that, and that would be helpful.

PRESIDENT WELCH: Are you ready for the question that this report be received and referred to the Executive Board?

. . . The motion was carried . . . (Report will be published in March issue.)

DR. GOSS: The Committee on Intelligence and Education recommends the following men for honorary membership in the Association: Sir Arnold Theiler, Professor Charles Porcher and Professor Alcide Railliet.

It was voted, on motion of Dr. Watson, duly seconded, that the recommendation be adopted . . .

DR. MAYO: Mr. President, I move that the Committee on Intelligence and Education consider and report upon the question of preparing some suitable form of acknowledgment to be presented to some veterinarian, member of this Association, or anywhere in the world, as a recognition for distinguished and exceptional work in connection with the advancement of veterinary science.

The motion was seconded by Dr. V. A. Moore . . .

DR. MAYO: I don't know but I would like to change that word "veterinarian" to veterinarian or scientist," with the consent of my second.

The idea I have in mind is that the Committee will consider the matter of a medal to be awarded by this Association as a recognition of outstanding scientific work in the advancement of veterinary science. It isn't my idea that this should be awarded every year. It may be a number of years, but what suggested it to me was the very remarkable work that has been done by a fellow member of this Association who sits here in front of me now, Dr. Hall. (Applause.)

PRESIDENT WELCH: If there are no further remarks, all those in favor of the motion will signify by saying "aye." The motion is carried unanimously.

DR. MERILLAT: Mr. Chairman, I am informed by the chief veterinarian of the military service that it is customary for the various associations concerned to give medals to meritorious students in the Government military schools. Whoever makes a high grade in the school of dentistry is given a medal by the dental association. The same applies to the medical officer who makes a high grade in the medical school.

I would suggest, therefore, that the Association, through its Committee on Intelligence and Education, give the same recognition to the army veterinarians who attend the army veterinary school at Washington. I make that in the form of a motion.

DR. MAYO: Before I second that motion, I would like to have it so worded that it would include Canada, if we can.

In other words, I would like to have this referred to the Committee for consideration, and report upon this subject.

DR. MERILLAT: I didn't have in mind any other school than the U. S. Army Veterinary School, that has just recently moved from Chicago, and which will henceforth function as a department of the Army Medical School, where it belongs.

It would seem to me that if there were an analogous institution in Canada, the graceful thing to do is for this Association to give a like medal to any such Canadian military officers. I shall add that to my motion. My Canadian colleagues will pardon my omission.

. . . The motion was seconded by Dr. Mayo . . .

DR. MERILLAT: The import of the motion is for this Association to contribute a medal as a prize to the best student in the Army Medical School.

. . . The motion was carried . . .

PRESIDENT WELCH: We have a report from the Committee on Resolutions.

. . . President Welch read the report of the Resolutions Committee . . .

REPORT OF COMMITTEE ON RESOLUTIONS

Your Committee on Resolutions desires on behalf of the American Veterinary Medical Association to thank the Local Committee on Arrangements; the retiring President and other officers of the Association and all others who have contributed to the success of the sixtieth anniversary of this Association for their untiring efforts and hearty cooperation. More particularly do we wish to express the appreciation of the Association for the splendid work of Dr. Hoskins as Secretary-Editor of the Association and JOURNAL.

RESOLUTION COMMITTEE,
Robert Graham, Chairman.

PRESIDENT WELCH: At this time may I not personally extend, especially to the Canadians on the Committee of Local Arrangements, my appreciation of the splendid efforts they have made in contributing to the success of the meeting?

DR. MAYO: I have been, of course, in an official way, situated so that I have known what a local committee means to a meeting of this Association, and I want to say (and I speak in an ex-officio capacity) that this is one of the best veterinary association meetings we have ever had. I think it is second in point of attendance. I think at the Ohio meeting, two or three years ago, we had a larger attendance, and I wish to take this opportunity of telling the people of Canada how much we appreciate the splendid meeting that they have given us here in Montreal. (Applause.)

DR. KIERNAN: I recommend that we adopt that motion by rising.

. . . The men arose and applauded . . .

. . . The report of the Audit Committee was called for, but no member of that Committee was present . . .

DR. WILLSON: In the absence of the Chairman of the Committee on Local Arrangements, I desire to thank you most sincerely for the hearty vote of thanks that has been given our efforts to entertain you at this anniversary of the American Veterinary Medical Association. We feel we have done only our duty, and the pleasure has been as much ours as yours.

We may have fallen down in some respects, but it is almost impossible to have everything carried out in proper detail. If the Chairman of the Committee, Dr. Baker, had been present, he would have been delighted to thank you properly in better words than I can select, but we appreciate very much the numbers with which you have attended, and particularly the number of women who have been present.

As a member of the Entertainment Committee, it has been my duty to look after the women, and I assure you that it has been a pleasure. The ladies, as a matter of fact, were the most easily entertained of any I have ever seen.

We are pleased, indeed, to know that you appreciate our efforts.

PRESIDENT WELCH: We will now have the report of the Budget Committee.

. . . Dr. Hoskins read the report of the Budget Committee, as follows:

President's Contingent Fund	\$ 500
Intelligence and Education	1000
Legislation	1000
Treasurer	300
Horse Association	50
Extension Work	1000

These differ from the appropriations last year in two respects. There is no appropriation for the Committee on Abortion or the Committee on Revision of Constitution and By-laws.

. . . It was voted, on motion of Dr. Mayo, seconded by Dr. Hilton, that the report of the Budget Committee be approved . . .

PRESIDENT WELCH: Unfinished business. Under the head of

unfinished business, we have a couple of papers that have not been presented, that I am sure you will want to listen to. I will call on Dr. Murphey, on the subject of "Corpus Luteum of the Ox Ovary in Relation to the Estrous Cycle."

Dr. Murphey presented his paper on the above subject, and also an abstract of his second paper, "Studies of the Estrous Cycle of the Ox" . . . (Applause.) (Papers will be published.)

PRESIDENT WELCH: The papers are open for discussion. If there is no discussion, we will proceed to new business.

Secretary Hoskins read a message from Sir Frederick Hobday . . .

PRESIDENT WELCH: Is there anything further under the order of new business? If not, the next order of business is the installation of new officers.

I will ask Dr. Murphey to escort the new President to the Chair. (Applause.)

Gentlemen of the Convention, it affords me the greatest pleasure to present to you your new President for the new year. (Applause.)

PRESIDENT-ELECT STANGE: Mr. President, Gentlemen: I assure you that I accept this with a full realization of the responsibility it carries with it. I shall exercise the prerogatives of my office in the interests of harmony and progress. I trust that my administration, Mr. President, may be as satisfactory and as successful as that of my predecessor. Thank you. (Applause.)

PRESIDENT WELCH: Are there any of our Vice-Presidents here? (None were present.)

Our Treasurer has gone home, so that concludes the installation of officers.

If there is nothing further to come before us, a motion to adjourn will be in order.

The meeting adjourned at four o'clock . . .

ADJOURNMENT

(To be continued)

The British Dairy Farmers' Association has awarded the gold medal to the government of Ontario for its collection of dairy produce, including bacon, poultry and eggs.

ORGANIZATION OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION 1923-1924

OFFICERS

C. H. Stange, President, Iowa State College, Ames, Iowa.
F. T. Daubigny, 1st Vice-Pres., 12 Rue St. Denis, Montreal, Que., Can.
H. E. Kingman, 2nd Vice-Pres., Fort Collins, Colo.
Geo. H. Hart, 3rd Vice-Pres., Univ. of California, Berkeley, Cal.
Capt. R. A. Kelser, 4th Vice-Pres., Army Medical Center, Washington, D. C.
Hamlet Moore, 5th Vice-Pres., 662 N. Rampart St., Baton Rouge, La.
H. Preston Hoskins, Secretary-Editor, 735 Book Bldg., Detroit, Mich.
M. Jacob, Treasurer, 312 W. Church St., Knoxville, Tenn.

EXECUTIVE BOARD

Cassius Way, Member-at-Large, (Chairman) 30 East 42nd St., New York, N. Y.
Geo. Hilton, 1st District, 126 Lewis St., Ottawa, Ont., Can.
T. E. Munce, 2nd District, Dept. of Agri., Harrisburg, Pa.
D. S. White, 3rd District, Ohio State University, Columbus, Ohio.
J. A. Kiernan, 4th District, B. A. I., Washington, D. C.
C. E. Cotton, 5th District, Old Capitol, St. Paul, Minn.
B. W. Conrad, 6th District, Sabetha, Kans.

SUB-COMMITTEE ON JOURNAL

D. S. White, Ohio State University, Columbus, Ohio.
J. A. Kiernan, B. A. I. Washington, D. C.

SECTION ON GENERAL PRACTICE

Harry Caldwell, Chairman, 324 So. Hale St., Wheaton, Ill.
E. R. Steel, Secretary, Grundy Center, Iowa.

SECTION ON EDUCATION AND RESEARCH

H. C. H. Kernkamp, Chairman, University Farm, St. Paul, Minn.
E. M. Pickens, Secretary, Univ. of Maryland, College Park, Md.

SECTION ON SANITARY SCIENCE AND POLICE

Orland Hall, Chairman, 92 Fourth St., Ottawa, Ont., Can.
J. H. McNeil, Secretary, State House, Trenton, N. J.

COMMITTEE ON INTELLIGENCE AND EDUCATION

B. T. Simms, Chairman, Oregon Agricultural College, Corvallis, Ore.
J. Fleming, 23 Federal Bldg., Kansas City, Kans.
L. W. Goss, Ohio State University, Columbus, Ohio.
T. H. Ferguson, 421 Broad St., Lake Geneva, Wis.
D. H. Udall, 106 Brandon Place, Ithaca, N. Y.

COMMITTEE ON LEGISLATION

J. G. Ferneyhough, Chairman, Box 656, Richmond, Va.
J. H. McNeil, State House, Trenton, N. J.
L. Enos Day, 1749 W. Pershing Rd., Chicago, Ill.
J. S. Koen, Bloomington, Ill.
C. J. Marshall, 5031 Pine St., Philadelphia, Pa.

BUDGET COMMITTEE (EX-OFFICIO MEMBERSHIP)

C. H. Stange, Iowa State College, Ames, Iowa.
M. Jacob, 312 W. Church St., Knoxville, Tenn.
H. Preston Hoskins, 735 Book Bldg., Detroit, Mich.
Cassius Way, 30 East 42nd St., New York, N. Y.

COMMITTEE ON RESOLUTIONS

J. R. Mohler, Chairman, Dept. of Agriculture, Washington, D. C.
A. D. Knowles, 502 So. 4th St. W., Missoula, Mont.
E. A. Watson, Biological Laboratory, Ottawa, Ont.
L. A. Merillat, 1827 So. Wabash Ave., Chicago, Ill.
R. C. Julien, Delphi, Ind.
John Patterson, Hedrick, Iowa.

COMMITTEE ON NECROLOGY

H. Preston Hoskins, Chairman, 735 Book Bldg., Detroit, Mich.
Benj. D. Pierce, 47 High St., Springfield, Mass.
A. H. Baker, 5651 S. Peoria St., Chicago, Ill.
J. I. Handley, P. O. Box 1533, Atlanta, Ga.
Edward Records, University of Nevada, Reno, Nev.

COMMITTEE ON HISTORY

John W. Adams, Chairman, 39th St. & Woodland Ave., Philadelphia, Pa.
O. V. Brumley, Ohio State University, Columbus, Ohio.
C. D. McGilvray, Ontario Veterinary College, Guelph, Ont., Can.
N. S. Mayo, 4753 Ravenswood Ave., Chicago, Ill.
G. H. Berns, 260 82nd St., Brooklyn, N. Y.
T. H. Edwards, 655 So. Catalina Ave., Pasadena, Cal.
P. A. Fish, N. Y. State Veterinary College, Ithaca, N. Y.

INTERNATIONAL COMMITTEE ON BOVINE TUBERCULOSIS

J. A. Kiernan, Chairman, B. A. I., Washington, D. C.
S. E. Bruner, c/o Live Stock Sanitary Board, Harrisburg, Pa.
C. E. Cotton, Old Capitol, St. Paul, Minn.
C. H. Case, 50 E. Buchtel Ave., Akron, Ohio.

COMMITTEE ON ABORTION

C. P. Fitch, Chairman, University Farm, St. Paul, Minn.
A. Eichhorn, Lederle Antitoxin Laboratories, Pearl River, N. Y.
W. W. Dimock, University of Kentucky, Lexington, Ky.
E. C. Schroeder, B. A. I., Exp. Station, Bethesda, Md.
Ward Giltner, P. O. Box 955, East Lansing, Mich.
J. F. DeVine, Goshen, N. Y.

COMMITTEE ON REVISION OF CONSTITUTION AND BY-LAWS

J. H. McLeod, Chairman, Charles City, Iowa.
C. A. Cary, Auburn, Ala.
Reuben Hilty, 619 Walnut St., Toledo, Ohio.
L. A. Klein, 39th St. & Woodland Ave., Philadelphia, Pa.
J. B. Hollingsworth, 105 Cambridge St., Ottawa, Ont., Can.

COMMITTEE ON PREVENTION OF TRANSMISSIBLE DISEASES OF ANIMALS

H. W. Turner, Chairman, New Hope, Pa.
Capt. R. A. Kelsner, Army Medical Center, Washington, D. C.
G. H. Hart, University of California, Berkeley, Cal.
A. F. Schalk, Agricultural College, No. Dak.
I. E. Newsom, Colorado Agricultural College, Fort Collins, Colo.

REPRESENTATIVE TO AMERICAN RESEARCH COUNCIL

L. W. Goss, Ohio State University, Columbus, Ohio.

A. V. M. A. REPRESENTATIVE ON BOARD OF MANAGERS, HORSE ASS'N OF AMERICA

W. H. Welch, Lexington, Ill.

LOCAL COMMITTEE ON ARRANGEMENTS FOR DES MOINES MEETING, 1924

H. E. Bemis, Chairman, Iowa State College, Ames, Iowa.
 R. D. Wall, 990 24th St., Des Moines, Iowa.
 E. R. Steel, Grundy Center, Iowa.
 H. J. Shore, c/o Fort Dodge Serum Co., Fort Dodge, Iowa.
 Col. J. H. Gould, 1019 High St., Des Moines, Iowa.
 H. D. Bergman, Iowa State College, Ames, Iowa.
 P. Malcolm, State House, Des Moines, Iowa.
 John Patterson, Hedrick, Iowa.
 C. W. Deming, 846 40th Place, Des Moines, Iowa.
 W. J. Miller, Des Moines, Iowa.
 N. J. Deiling, Dallas Center, Iowa.

RESIDENT STATE SECRETARIES

Alabama.....I. S. McAdory, Auburn.
 Arizona.....J. C. Norton, 201 Fleming Building, Phoenix.
 Arkansas.....H. W. Wilson, 218 Rightor St., Helena.
 California.....J. L. Tyler, 120 E. Belgrave Ave., Huntingdon Park.
 Colorado.....A. N. Carroll, 301 W. 3rd St., Pueblo.
 Connecticut.....A. T. Gilyard, 81 Field St., Waterbury.
 Delaware.....R. O. Biltz, P. O. Box 92, Georgetown.
 Dist. of Columbia..T. P. White, B. A. I., Washington.
 Florida.....A. L. Shealy, University of Florida, Gainesville.
 Georgia.....A. G. G. Richardson, 1234 S. Lumpkin St., Athens.
 Idaho.....E. T. Baker, Moscow.
 Illinois.....H. B. Raffensperger, 6837 S. Marshfield Ave., Chicago.
 Indiana.....R. C. Julien, Delphi.
 Iowa.....W. F. Guard, Iowa State College, Ames.
 Kansas.....A. H. Gish, Eldorado.
 Kentucky.....W. W. Dimock, University of Kentucky, Lexington.
 Louisiana.....Harry Morris, Experiment Station, Baton Rouge.
 Maine.....J. B. Reidy, State Capitol, Augusta.
 Maryland.....G. H. Grapp, 3009 Clifton Ave., Baltimore.
 Massachusetts....H. W. Peirce, 13 Chardon Road, West Medford.
 Michigan.....J. E. Wurm, Pigeon.
 Minnesota.....D. B. Palmer, 1054 14th St. S. E., Minneapolis.
 Mississippi.....R. H. Mohlenhoff, Cleveland.
 Missouri.....Ralph Graham, Box 59, Jefferson City.
 Montana.....A. D. Knowles, 302 S. 4th St. W., Missoula.
 Nebraska.....Floyd Perrin, Box 311, Lincoln.
 Nevada.....Edward Records, University of Nevada, Reno.
 New Hampshire....F. F. Russell, Concord.
 New Jersey.....E. W. Smillie, Rockefeller Institute, Princeton.
 New Mexico.....O. E. Troy, Raton.
 New York.....Earl Sunderville, Forest Home, Ithaca.
 North Carolina....J. P. Spoon, 317 Worth St., Burlington.
 North Dakota....J. B. Hollenbeck, Bismarek.
 Ohio.....C. H. Case, 50 E. Buchtel Ave., Akron.
 Oklahoma.....F. F. Meads, Cherokee.
 Oregon.....B. T. Simms, Oregon Agricultural College, Corvallis.
 Pennsylvania.....H. R. Church, B. A. I., Harrisburg.
 Rhode Island.....T. E. Robinson, Providence.
 South Carolina....M. R. Blackstock, 151 Hampton Ave., Spartanburg.

South Dakota.....	C. C. Lipp, Brookings.
Tennessee.....	F. W. Morgan, 6th & Cherry Sts., Chattanooga.
Texas.....	R. P. Marsteller, College Station.
Utah.....	H. J. Frederick, Logan.
Vermont.....	L. H. Adams, State House, Montpelier.
Virginia.....	Thomas Fraser, 2623 Hanover Ave., Richmond.
Washington.....	Bernard Johnson, Union Stock Yards, Spokane.
West Virginia.....	Ernest Layne, Huntington.
Wisconsin.....	R. A. Garman, 814 Superior Ave., Tomah.
Wyoming.....	Cecil Elder, University of Wyoming, Laramie.

RESIDENT PROVINCIAL SECRETARIES

Alberta.....	J. C. Hargrave, Medicine Hat.
British Columbia...	J. W. Frank, 1546 Monterey Ave., Victoria.
Manitoba.....	J. B. Still, 711 Boyd Bldg., Winnipeg.
New Brunswick....	
Nova Scotia.....	J. Steen, Customs Bldg., Halifax.
Ontario.....	
Prince Edw. Isl'd...	C. J. Bonsfield, 120 Upper Prince St., Charlottetown.
Quebec.....	J. H. Villeneuve, 200 Dorchester W., Montreal, Que.
Saskatchewan.....	M. Barker, Post Office Bldg., Regina.

RESIDENT TERRITORIAL SECRETARIES

Alaska.....	B. C. Parker, Afognak, Whale Island.
Cuba.....	B. Crespo, Apartado No. 2518, Havana.
Hawaii.....	H. B. Elliott, Box 167, Hilo.
Philippine Isl'ds...	Stanton Youngberg, Bur. of Agri., Manila.

RESIDENT FOREIGN SECRETARIES

British Isles.....	R. W. Tuck, c/o Amer. Consulate, 18 Cavendish Square, London, England.
Mexico.....	L. Santa Maria, Apartado Postal No. 2067, Mexico, D. F., Mex.
South America....	G. A. Roberts, Agri. College, Lavras, Minas, Brazil.

WOMEN'S AUXILIARY

Mrs. G. A. Johnson, President, 86 No. James St., Kansas City, Mo.
Mrs. W. B. Aulgar, Vice-President, Paxton, Ill.
Mrs. R. P. Marsteller, Secretary, College Station, Texas.
Mrs. H. P. Hoskins, Treasurer, Rosedale Park, Redford, Mich.

PERSONALS

Dr. James J. Black (K. S. A. C. '23) has accepted the position of Extension Veterinarian at the Kansas State Agricultural College, succeeding Dr. D. E. Davis, whose resignation was announced in the December issue of the JOURNAL.

Dr. Bruce Blair (U. P. '09), of New York City, has established the Jeanette Blair prize of \$50, at the University of Pennsylvania School of Veterinary Medicine, to be awarded to the senior student doing the best work in the small animal clinic. This is the second such prize to be established by an alumnus, Dr. T. E. Munce (U. P. '04) having previously established a prize of \$25, to be awarded for the best work in the course in animal industry.

WOMEN'S AUXILIARY LOAN FUND

The Women's Auxiliary to the American Veterinary Medical Association offered to lend, each year, beginning July 1, 1922, to a senior in attendance at one of the recognized veterinary colleges in the United States or Canada, a sum, not to exceed \$350.00 subject to the following conditions:

1. The student shall be recommended by the Chairman of the Committee on Intelligence and Education, of the A. V. M. A., and approved by the Chairman of the Executive Board of the same organization.

2. Scholastic attainment, financial need, character and recommendation from the Dean of the college or colleges which the applicant has attended, shall be factors determining the eligibility of the candidate.

3. When there is more than one applicant for the loan, order of selection shall be determined by rank of previous scholastic attainments.

4. This loan of \$350.00 shall be refunded to the Women's Auxiliary, with interest at 4%, in two, yearly installments of \$175.00 each; the first installment to be paid not later than one year after graduation, or the date on which the applicant is scheduled to graduate; the second installment to be paid not later than two years after graduation, or the date on which the applicant is scheduled to graduate.

5. In guarantee thereof the student shall furnish not less than two guarantors, endorsed by the Dean signing his application, that the sum will be paid within the specified time.

6. Each application, accompanied by its recommendation and guarantee, shall be presented to the Secretary of the Women's Auxiliary and must be approved by the President and Secretary of that organization.

7. The payments of the fund, and all matters connected with it, which are purely of a financial nature, shall be in the care of the Treasurer of the Women's Auxiliary, subject to the approval of the President and Secretary of that organization.

8. If, at any time, the funds of the Women's Auxiliary are sufficient for such purpose, additional loans may be made subject to the same conditions as the original loan for that year.

9. The power to grant these additional loans shall be vested in the Executive Committee of the Women's Auxiliary.

10. It is recommended that mention of the Loan Fund be made in the catalogues of every recognized veterinary college in the United States and Canada, and that a copy of the conditions under which the loan may be secured be filed in the office of the Secretary of each of these institutions.

11. When the funds of the Auxiliary have reached the sum of \$5000.00 the loans shall be withdrawn and the money placed, with suitable security, where it will bear interest.

12. This interest shall be used to establish a scholarship under conditions similar to those which apply to the loan, except that the money shall not be refunded to the Women's Auxiliary, but shall be a gift to the student fulfilling the specified requirements.

13. Any change in these requirements and conditions may be made by a two-thirds vote of all members present at any regular business meeting of the Women's Auxiliary, provided that such a change has been approved by the Executive Committee of that organization, and that full notice of the same has been included in the call for that meeting.

OTHER MEETINGS

NEBRASKA STATE VETERINARY MEDICAL ASSOCIATION

True to tradition the twenty-sixth annual meeting of the Nebraska State Veterinary Medical Association, held at Grand Island, December 11-12, 1923, was well attended and was much appreciated by all, both from the educational and social standpoints. The meeting was unique in that it was the first convention to be held in the new fireproof Hotel Yancey, just completed, of which the citizenry of Grand Island is justly proud. The building with all its modern conveniences contributed in a large measure to the success of the meeting.

The morning session of the first day was called to order by the President, Dr. D. W. Hurst, of Tecumseh, who, following roll-call by the Secretary, introduced Hon. T. W. Ellsberry, Mayor of Grand Island, who gave the address of welcome which was responded to by Dr. J. S. Anderson, of Lincoln. The president's address was the next in order and a great many valuable points were alluded to by Dr. Hurst which will long be remembered by those present.

The first subject on the program was a paper by Dr. G. A. Young, of Syracuse, "Dosage, Method of Administration and Toxicology of Oil of Chenopodium," this pertaining more particularly to swine. The paper was well written and presented, giving rise to much discussion which lasted until noon, when recess was taken until 1:30 p. m., the meeting to convene at the Blain Horse Pavilion, for a clinical session.

The clinic was above the average, judging from the interest manifested in the various demonstrations consisting of the following: "Spaying of Young Calves," by Dr. L. V. Skidmore, of Lincoln; "Round Worms in Swine" (Lecture and Demonstration), by Dr. H. B. Raffensperger, of Chicago, Ill.; "Nasal Polypus Operation in Horse," by Dr. J. S. Anderson, of Lincoln; "Ridgling Castration," by Dr. H. E. Bemis, of Ames, Iowa; "Poultry Judging and Medication," by Dr. C. E. Ackerman, of Wilber; "Restraint," by Dr. L. V. Lewman, of Big Springs. The clinic was in charge of Dr. A. A. Anderson, assisted by Drs. McGinnis, Foster and Rose.

The annual banquet, at 6:30 p. m., in the Hotel Yancey, was the social feature of the session, as it always is at the Nebraska

meetings, and if there are any out-of-state veterinarians who doubt the ability of our practitioners to enjoy themselves, they are cordially invited to come and see things at first hand, as did Dr. B. W. Conrad, of Sabetha, Kans., whose arrival was a pleasant surprise.

While partaking of the well prepared banquet, music was furnished by a specially selected portion of the famous Des Dunes Band, of Omaha, and the Y. M. C. A. Glee Club, of Grand Island, whose pleasing numbers were much enjoyed. The speaker of the evening, following the banquet, was Mr. G. W. Cowden, president of the local Chamber of Commerce, who extended a welcome to the visiting members, their wives and friends. Response was given by Dr. W. T. Spencer, of Lincoln. Short talks were given by Mr. W. I. Blaine, of Grand Island, Dr. H. E. Bemis, of Ames, Iowa, Dr. R. C. Moore, of St. Joseph, Mo., and Dr. D. W. Hurst, president of the Association.

Dr. L. Van Es, of Lincoln, having established his reputation as toastmaster at the 1922 banquet, was again called upon to act in like capacity this year, which he kindly consented to do and was true to form. Red carnations were the only decorations. The beauty of the banquet room needed nothing additional to make a perfect setting. Favors in the form of toy balloons and paper hats added merriment to the occasion. Dancing followed the speaking, lasting until 1:30, with music furnished by Powell's Orchestra, which completed an evening of perfect enjoyment.

At the morning session of the second day, following reports of the Secretary-Treasurer and of the various standing committees, the names of eleven applicants for membership were read, voted on and accepted. Dr. L. Van Es then presented his subject, "New Points on Tuberculosis," bringing out many interesting points to which he has been giving much attention during the past year.

The out-of-state guest this year was Dr. H. E. Bemis, of the Department of Veterinary Surgery of the Iowa State College, at Ames, Iowa, and to Dr. Bemis is given much credit for making the meeting a success. His subject, illustrated by lantern slides, "Surgery of the Head of the Horse and Ox," was intensely interesting and conveyed many practical ideas to the veterinarians in attendance.

The election of officers resulted as follows: Dr. W. J. Moslander, of Grand Island, President; Dr. H. E. Foster, of Kearney,

Vice-President; and Dr. F. R. Woodring, of Lincoln, re-elected Secretary-Treasurer.

Papers presented during the afternoon session were as follows: "General Cattle Practice," by Dr. P. Phillipson, of Holbrook; "The Viewpoint of the Breeder and Feeder on Swine Sanitation and Observation of Its Value in Nebraska," by Prof. M. B. Posson, of the University of Nebraska, Lincoln; "Points of Interest to Veterinarians," by Dr. L. R. Cantwell, Chief, Nebraska B. A. I.; "Differentiation of Diseases in Dogs Resembling Distemper," by Dr. F. Perrin, of Lincoln; "Practical Poultry Pointers," by Dr. C. E. Ackerman, of Wilber; "Observations on Some of Nebraska's Poisonous Plants," by Dr. J. M. Simpson, of Alliance; "The Ox Warble," by Dr. H. M. Martin, of Lincoln; and "Veterinary Corps of the National Guard," by Dr. C. J. Norden, of Lincoln.

Dr. Norden then explained a plan for a publicity campaign to be carried on by the Association for the coming year, which met with the approval of those present and a decision was made to enter into it. The purpose of the campaign is to let the public know something about what the profession stands for and is accomplishing.

Through the courtesy of the Chamber of Commerce and the local veterinarians and their wives, the visiting ladies were entertained. Luncheons, theatre parties and trips to points of interest about Grand Island made up a very enjoyable program for the ladies.

F. R. WOODRING, *Secretary-Treasurer.*

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS—MISSISSIPPI VALLEY DIVISION

The meeting of the Mississippi Valley Division of the National Association of Bureau of Animal Industry Veterinarians, held Dec. 15, 1923, at National Stock Yards, Ill., was well attended and many items of interest to the Bureau Veterinarians and the veterinary profession in general were discussed.

Drs. J. S. Jenison and L. C. Stewart, delegates to the recent convention of our Association, held at Chicago, rendered very interesting reports of the matters acted upon at the convention.

The following were elected officers of this Division for the

coming year: President, Dr. L. C. Stewart; Secretary, Dr. G. H. Bruns; Treasurer, Dr. S. L. Blount.

Those present at the meeting were: Drs. W. M. Robertson, J. W. Joss, G. H. Bruns, G. C. Pieper, F. S. Thurmon, H. J. Timmerman, C. R. Graham, W. L. Cohenour, F. E. Hill, S. L. Blount, A. R. Zumwalt, L. C. Stewart, T. Hartman, R. E. Surring, J. S. Jenison, R. C. Lambert, J. F. Pease, M. L. Crans and A. J. Maloney.

G. H. BRUNS, *Secretary*.

DELAWARE VETERINARY MEDICAL ASSOCIATION AND UNIVERSITY VETERINARY CONFERENCE

The annual meeting of the Delaware Veterinary Medical Association and University of Delaware Veterinary Conference was held at Wolf Hall on December 19. There was an excellent attendance at the meeting and the impression seemed to be unanimous that it was the best meeting ever held by the Association.

President McDaniel, of Dover, opened the meeting and delivered the address of welcome. The Secretary gave a report of the summer meeting at Rehoboth and reported also on the work of the Department of Animal Industry of the University carried out during the past year. It was pointed out to those assembled that since the agricultural experiment stations are supported by all the people, and that the specific role of the Animal Industry Department is to foster improvements in live stock and poultry production, the cooperation of the veterinarians is essential if the department is to live up to its obligations, and that it is the primary object of the University conferences to work out plans for the advancement of the animal industry of the state.

Dr. Morris L. Zurkow gave a very interesting and instructive talk on swine diseases, confining himself chiefly with the disease encountered in the field while investigating swine disease outbreaks.

Dr. W. G. Middleton, who is in charge of tuberculosis eradication in Delaware and New Jersey, gave a report upon the progress of this work in Delaware. The statistics quoted by Dr. Middleton make it quite plain that the disease is being eradicated in the cattle herds of this state.

Dr. T. E. Munce, State Veterinarian of Pennsylvania, addressed the conference upon the subject of "Live Stock Sanitary Control

Work." Dr. Munce demonstrated by the aid of maps and charts the plan of organization of the live stock sanitary work as carried out in Pennsylvania. This talk was very instructive and timely, and will doubtless prove a valuable guide and aid in promoting disease control work in this state.

Professor T. A. Baker, specialist in dairying, of the University of Delaware, discussed the subject of rations for the dairy cow. Prof. Baker has worked out a simplified and practical method of balancing dairy rations and, before explaining the method, each member was presented with a two-page, mimeographed sheet, showing in detail the method of compounding the ration.

Dr. F. P. Ruhl, of Milford, gave a very interesting report on several outbreaks of poisoning from poisonous plants.

Prof. H. R. Baker, of the University, presented a paper on "Bacillary White Diarrhea in Poultry."

Officers elected for the year are: Dr. H. P. Eves, Wilmington, President; Dr. C. C. Palmer, Newark, Secretary-Treasurer; Dr. F. P. Ruhl, Milford, Dr. H. B. McDowell, Middleton, and Dr. A. S. Houchen, Newark, members of the Executive Committee.

C. C. PALMER, *Secretary*.

CENTRAL CANADA VETERINARY ASSOCIATION

The annual meeting of the Central Canada Veterinary Association was held in the Council Chamber, City Hall, Ottawa, on January 16, 1924. A goodly number were present, including Dr. A. Dauth, representing the Quebec Veterinary Association, and a very profitable session was held. The president, Dr. Geo. Hilton, occupied the chair. Letters of regret at being unable to be present were received from Dr. T. C. Evans, Stanley Barracks, Toronto; Dr. W. J. R. Fowler, of the Ontario Veterinary College, Guelph; and Dr. W. C. McQuire, of Cornwall.

After the routine business had been disposed of, Dr. J. McL. Stuart, Veterinary Inspector, Department of Agriculture, Ottawa, gave a paper on the work of the Veterinary Corps in the Great War. Dr. E. A. Watson, Chief Pathologist, Department of Agriculture, Ottawa, gave a paper on Contagious Abortion. Dr. Geo. Rothwell, Dominion Animal Husbandman, spoke on the experiences and problems of the Experimental Farms with this disease.

A resolution, moved by Dr. J. B. Hollingsworth, Chief Food Inspector, Ottawa, seconded by Dr. W. C. Young, of Almonte,

that a committee of three members of this Association be appointed by the President to study the problem of contagious abortion and to collaborate with other similar committees and associations to promote means and measures of advancing the solution of the problem, was proposed and adopted. The President named Dr. J. B. Hollingsworth, of Ottawa; Dr. J. A. Bean, of Winchester; and Dr. W. C. Young, of Almonte, on this committee.

Dr. J. B. Hollingsworth spoke on the question of veterinary legislation, and with particular reference to the amendments to the Ontario Veterinary Practice Act, which it is proposed to submit at the present session of the Ontario Legislature. Following the reading of the papers, very interesting discussion was engaged in by the members, led by Dr. J. A. Bean, of Winchester, Dr. H. L. Perley, of Hanover, New Hampshire, and Dr. Abraham, of Kemptville.

Prior to the election of officers, Dr. Geo. Hilton, President for the past eleven years, thanked the members for the honor and support that had been accorded him during his time of office, but, owing to additional duties entailed in the position of Acting Veterinary Director-General, he requested that someone else be elected as President of the Association. This was reluctantly assented to, and a standing vote of thanks was unanimously passed, expressing the appreciation of the members for the valuable assistance that Dr. Hilton had given during his tenure of office as President.

Applications for membership were received from Dr. J. McL. Stuart, Veterinary Inspector, Ottawa; Dr. Norman Beaver, Veterinary Inspector, Ottawa; and Dr. Geo. E. Stanley, of the Pathological Division, Ottawa.

The report of the nominating committee was received, and the following officers duly elected for the ensuing year:

Honorary Patrons, Hon. W. R. Motherwell and Dr. J. H. Grisdale; Honorary President, Dr. Geo. Hilton; President, Dr. J. A. Bean; Vice-President, Dr. A. W. Harris; Secretary-Treasurer, Dr. W. H. Marriott; Council, Drs. O. Hall, F. Fisher, J. Bordeau, W. C. Young, W. Nicholls, J. B. Hollingsworth, P. W. O'Hara and Dr. Geo. Hilton; Auditors, Drs. H. D. Sparks and J. McGregor.

W. H. MARRIOTT,
Secretary-Treasurer.

COMMUNICATION

TO THE EDITOR:

I take pleasure in informing you that in connection with the fortieth anniversary of the Bureau of Animal Industry, next May, a book dealing with the work of the Bureau from its beginning up to the present time is in course of publication. In response to frequent requests for authentic information conveniently arranged, Dr. U. G. Houck, of the Bureau, has prepared the material, aided by chiefs of the various divisions and offices.

The book gives the history of the Bureau of Animal Industry, its development, and its current activities. It contains especially complete discussion of accomplishments in veterinary work. It also contains the answers to many questions constantly arising with respect to Government live stock research and field activities.

The book will contain about 300 pages, 6" x 9", and will be substantially bound in cloth. The public printing fund is not available for publishing a book of this kind, consequently it will be printed by a private concern and distributed at cost price. If only 1,000 copies are printed, the cost will be approximately \$1.75 per copy. On the basis of 3,000 copies, the cost will be in the neighborhood of \$1.00 per copy. It is hoped that the subscriptions will exceed 3,000.

The edition will be limited to the number of subscriptions received within the next 60 days. We desire to secure as many subscriptions as possible, and would be pleased if you would bring this matter to the attention of other friends of the Bureau in your community who might desire a copy. Bills will be sent when the books are ready for delivery. All subscriptions and other communications in regard to this matter should be mailed to Dr. U. G. Houck, The Manchester, 1426 M Street Northwest, Washington, D. C.

J. R. MOHLER.

Washington, D. C., January 15, 1924.

NECROLOGY

DR. ALBERT BUCK

Dr. Albert Buck, of Urbana, Ohio, died November 29, 1923, following an attack of apoplexy, suffered immediately following a football game at Bellefontaine, which he had attended with his sons.

Born at Rosewood, Ohio, June 14, 1878, Dr. Buck, received a common school education, including a teacher's certificate, and then entered the Western Veterinary College, of Kansas City, Mo. He was graduated from this institution in 1903. He first located at Crayon, later moving to Urbana, about 1911.

Dr. Buck joined the Ohio State Veterinary Medical Association in 1911 and the American Veterinary Medical Association in 1920. He was a Mason, a member of the Shrine Club, the Odd Fellows and the Loyal Order of Moose. He married Miss Ida May Bradson, at Urbana, February 3, 1900, and to this union eight children were born. In addition to his widow and eight children, Dr. Buck is survived by his mother, a brother, a half-brother and a sister.

I. I. SCHMIDT

In the July 1923 issue was noted the reported death of Dr. I. I. Schmidt, of Kolding, Denmark. As stated in the August issue, this report proved to be very badly exaggerated, as Dr. Schmidt was alive and well at that time. Again we have received a report of the death of Dr. Schmidt, this time believed to be authentic.

Few men have to their credit any discovery that has been of as great value to the live stock industry as Dr. Schmidt's discovery of a cure for milk fever. It is all the more to his credit that he made no attempt to keep his treatment a secret or to capitalize on it in any way.

It is said that Dr. Schmidt died a comparatively poor man, which is one of the greatest tributes that could be paid him, considering what his discovery was actually worth. He gave it freely to the world and his only reward was the honor that went with it—a rich honor, not measured by gold.

FRED A. WILSON

Dr. Fred A. Wilson, of Green Bay, Wis., died December 1, 1923. He was a graduate of the Ontario Veterinary College, class of 1895, and one of the leading practitioners of the Badger State. He held license 17 from the State Board of Veterinary Examiners.

Dr. Wilson was a member of the Wisconsin Veterinary Medical Association. He joined the A. V. M. A. in 1910.

JOHN THOMSEN

Dr. John Thomsen, of Armstrong, Iowa, died recently, at the age of 59. He was a graduate of the Ontario Veterinary College, class of 1895. He joined the A. V. M. A. in 1916. He was a member of the Iowa Veterinary Association. Death was caused by heart trouble.

HOWARD J. WATKINS

Dr. Howard J. Watkins, of Memphis, Tenn., died in the Baptist Memorial Hospital, Memphis, January 4, 1924, following an operation for appendicitis.

Born in Memphis, April 15, 1892, Dr. Watkins took three years of high school work and then entered the McKillip Veterinary College. He was graduated in 1918. He joined the A. V. M. A. the following year. He was a member and officer of the Memphis Kennel Club.

Dr. Watkins is survived by his father and mother, three brothers and two sisters.

MARRIAGE

Dr. Gail M. Umberger (K. S. A. C. '19), of Harveyville, Kansas, to Miss Georgia Johnson, December 22, 1923.

BIRTHS

To Dr. and Mrs. J. S. Barbee, of Sutton, Nebr., a son, James S., Jr. November 3, 1923.

To Dr. and Mrs. M. C. Linnemann, of St. Joseph, Minn., twins, a daughter, Myra Kathleen, and a son, Iver Martin, November 13, 1923.

To Dr. and Mrs. Wallace, of North Bend, Nebr., a son, Ordean, October 24, 1923.

To Dr. and Mrs. E. W. Youngblood, of Union City, Tenn., a daughter, Margaret Abbe, November 15, 1923.

To Dr. and Mrs. T. J. Eagle, of New Hampton, Mo., a son, Hugh John, December 16, 1923.

To Dr. and Mrs. J. W. Benner, of Ithaca, N. Y., a daughter, Mary DeNell, December 17, 1923.

To Dr. and Mrs. Harry F. Seymer, of Milwaukee, Wis., a daughter, Luella Emily Marie, December 11, 1923.

PERSONAL

Dr. J. A. Theoret (Laval '13) has removed from Montreal to Berthierville, Quebec.

Dr. W. L. Hanson (McK. '08) has removed from Greene, Iowa, to Corning, same state.

Dr. George T. Hill (K. S. A. C. '12) is City Meat and Milk Inspector of Topeka, Kans.

Dr. DuBois Jenkins (Corn. '18) has removed from Cobleskill, N. Y., to Warwick, N. Y.

Dr. R. J. Robertson (San. Fran. '17) has removed from Richmond, Calif., to Phoenix, Ariz.

Dr. N. B. Smith (O. S. U. '93), of Billings, Mont., writes: "Couldn't get along without the JOURNAL."

Dr. James W. Crouse (U. P. '15) is with the Bureau of Animal Industry of New Jersey, stationed at Trenton.

Dr. Glen Biddle (Ont. '10), of Bryan, Ohio, is manager of The Jefferson (Registered) White Collie Kennels.

Dr. G. H. Myland (K. S. A. C. '04) is City Commissioner of Streets and Public Utilities, of Horton, Kansas.

Dr. G. S. Jackson (Ind. '13) has removed from Birmingham, Ala., to 7709 Snowden St., Pittsburgh, Pa.

Dr. L. B. Graham (St. Jos. '09), of Cedar Rapids, Iowa, is president of the Iowa Tamworth Swine Association.

Dr. Fred A. Spade (Gr. R. '17), formerly at Constantine, Mich., is now at 147 W. Chicago St., Coldwater, Mich.

Dr. G. P. Mayer (Chi. '16) has changed his base of operations from Petoskey, Mich., to 238 Leslie St., Lansing, Mich.

Dr. E. A. Caslick (Corn. '21), of Lexington, Ky., spent the Christmas season with his parents, at Newfield, N. Y.

Dr. L. E. Long (Chi. '210) is now located at Princeton, Ill., as County Veterinarian on tuberculosis eradication work.

Lt. James E. Noonan (Ont. '11) has been transferred from Camp Thuax, Stithton, Ky., to Fort Benjamin Harrison, Ind.

Dr. J. R. Starkey (K. S. A. C. '22) is building a small animal hospital in connection with his practice at Blackwell, Okla.

Dr. R. Riddell (Ont. '80) has changed locations, from Seattle, Wash., to 460 Chester St., Victoria, British Columbia, Canada.

Dr. Carl J. Norden (K. C. V. C. '11), of Lincoln, Nebr., has received a major's commission in the Veterinary Reserve Corps.

Dr. Marnie E. Wesner (Terre Haute '12), of Ohio, Ill., writes: "The JOURNAL has many good things for the veterinarian."

Dr. F. B. Hadley (O. S. U. '07), of the University of Wisconsin, has received a commission as Captain in the Veterinary Reserve Corps.

Dr. Victor G. Kimball (Corn. '08) of the University of Pennsylvania Veterinary Faculty, was recently confined to his bed by illness.

Dr. F. E. Hill, formerly stationed at Nebraska City, Nebr., has been transferred to the meat inspection force at National Stock Yards, Ill.

Dr. William G. Keehn (K. C. V. C. '11), of Kansas City, Mo., has received a commission as first lieutenant in the Veterinary Reserve Corps.

Dr. R. J. Schermerhorn (San. Fran. '14) has removed from Elgin, Ill., to Redlands, California. His new address is 106 E. Citrus Avenue.

Dr. F. H. McNair (Corn. '05) was among those who lost their homes and contents in the fire which visited Berkeley, Calif., in September.

Dr. Wm. T. Conway (Harv. '01) has been transferred from New Haven, Conn., to Pittsburgh, Pa., in the B. A. I. meat inspection service.

Dr. Leslie G. Marshall (U. P.), of Towanda, Pa., has returned from a business trip to Texas, where he was looking after his oil interests.

Dr. V. W. Knowles (K. C. V. C. '07), of Ronan, Mont., has requested that his JOURNAL be sent to him at Miami, Florida, until further notice.

Dr. Thomas Hartman was recently transferred from Kansas City, Kansas, to National Stock Yards, Ill., in the B. A. I. meat inspection service.

Dr. R. M. Mullings (N. Y. C. V. S. '89) has been transferred from South St. Paul to New Haven, Conn., in the B. A. I. meat inspection service.

Dr. H. C. Hughes (K. C. V. C. '12), formerly in practice at Scott's Bluff, Nebr., has accepted a position with the Detroit (Mich.) Board of Health.

Dr. H. W. Graybill (Geo. Wash. '11), formerly located at the Rockefeller Institute of Animal Pathology, at Princeton, N. J., is now in Berkeley, Calif.

Dr. T. H. Ferguson (Ont. '96), of Lake Geneva, Wis., was recently elected a director and vice-president of the Farmers' National Bank of Lake Geneva.

Dr. B. Harry Sayre (K. C. V. C. '08), formerly with the Bureau of Animal Industry, at Sioux Falls, S. Dak., has resumed practice at Centerville, So. Dak.

Dr. Wm. Albertson Haines (U. P. '07), of Bristol, Pa., has been appointed, by Governor Pinchot, on a committee to investigate Pennsylvania farm conditions.

Dr. S. J. Gibson (Ont. '07), formerly of Govan, Sask., is now located at Souris, Man., with the Dominion Dept. of Agriculture, Health of Animals Branch.

Dr. John N. Rosenberger (U. P. '10), of Wycombe, Pa., was recently elected Secretary-Treasurer of the Pennsylvania Farmers' Cooperative Association.

Dr. Emil Pohl (O. S. U. '91), of Buffalo, N. Y., is reported to be recovering slowly from an illness dating back five months, during which time he was confined to his home.

Dr. T. E. Munce (U. P. '04), State Veterinarian of Pennsylvania, addressed the annual meeting of the county agents of Pennsylvania, at State College, Pa., on January 7, 1924.

Dr. Geo. E. Totten (Chi. '98), for several years in charge of B. A. I. meat inspection work at Pittsburgh, Pa., has been placed in charge of the same project at South St. Paul.

Dr. A. J. Allott (Corn. '17), of Newburgh, N. Y., with his wife, were in an automobile accident, in Cleveland, recently. Dr. Allott writes that "We are just getting to rights again."

Dr. H. T. Carpenter (Ont. '88), of Detroit, Mich., was confined to the hospital for about two weeks recently, with gangrene of one finger. Heroic surgical treatment saved the finger.

Dr. M. R. Higbee (McK. '11), of Albert Lea, Minn., writes that he is "doing fine now." He was sick for four months the past summer, and underwent a serious operation in October.

Dr. W. D. Foss (K. S. A. C. '23) has located at Cooperstown, N. D., succeeding Dr. H. O. Helmer. Dr. Foss is interested in German police dogs, and has some fine specimens for sale.

Dr. A. F. Schalk (O. S. U. '08) has returned to his post of duty at the North Dakota Agricultural College, after an absence of six months, spent in pursuing post-graduate work, in Chicago.

Drs. V. A. Moore and W. A. Hagan, of the Cornell Veterinary Faculty, attended the annual meeting of the Society of American Bacteriologists, in New Haven, Conn., during Christmas week.

Dr. Miller F. Barnes (U. P. '11), Director of the Penna. B. A. I. Laboratory, Philadelphia, Pa., recently addressed the Lancaster County (Pa.) Holstein-Friesian Association on the subject of "Abortion."

Dr. Joseph Hawkins (Ont. '71), of Detroit, Mich., has presented to the A. V. M. A. library a set of Gamgee's "Our Domestic Animals in Health and Disease," in four volumes, published over fifty years ago.

Drs. Francis L. Gallagher (Corn. '06), of Dover, Del., B. A. Gallagher (Corn. '01), of Washington, D. C., and W. C. Snyder (Corn. '18), of Watertown, N. Y., visited relatives in Ithaca, N. Y., during the Christmas holidays.

Dr. George E. Jorgenson (McK. '15), of Clermont, Iowa, who has been taking post-graduate work at Cornell University for some time, accompanied by Mrs. Jorgenson, left for an extended trip through the West, February 1st.

Dr. Thomas D. James (U. P. '08), of Scranton, Pa., has been made a member of the Board of Governors of the Lackawanna Kennel Club. At its recent show this club had two more entries than the show held in Madison Square Garden.

Dr. H. R. Church (Ont. '92), Deputy State Veterinarian of Pennsylvania, was one of the speakers at the regular meeting of the Philadelphia Club for Horsemen, held in Pearson Hall, U. of P. School of Veterinary Medicine, January 16, 1924.

Lt. Lloyd C. Ewen (U. P. '17) is the proud owner of "Ranger," winner of first place and a silver cup in the class for Officers' Chargers, at Fort Ethan Allen, Vermont, on October 31, 1923. "Ranger" has won in many shows, both civilian and military.

Dr. Louis A. Klein (U. P. '97), of Philadelphia, Pa., addressed a combined meeting of the Jefferson County (Pa.) Medical Association and the Mahoning Valley Veterinary Club, at Reynoldsville, Pa., on January 17, 1924, on the subject of "Tuberculosis and Our Milk Supply."

Dr. S. W. Haigler (McK. '19) has discontinued his practice at Bellflower, Ill., and is now associated in practice with Dr. J. C. Flynn, of Kansas City, Mo. Dr. Haigler practiced at Bellflower for five years, and was recently elected president of the McLean County (Ill.) Veterinary Association.

Dr. H. E. Van Der Veen (Chi. '17), of Lake Geneva, Wis., was elected Post Commander of Frank Firesen Post No. 24 of the American Legion at Lake Geneva for the year 1924, on Dec. 23, 1923. On the same night his brother was elected Post Commander of the local Legion Post at Hebron, Ill. Dr. Van Der Veen also served the Walworth (Wis.) Post as Commander for the years 1919, 1920 and 1921.

Dr. W. S. Newman (Corn. '07) has been appointed assistant coach of the Cornell University crews. Dr. Newman was prominent in athletics while at Cornell. He rowed bow oar on the Varsity crew in 1906 and 1907. He was center on the football team for three years, and helped to establish boxing as a sport at Cornell. Dr. Newman has resigned from the government service, and began active work with John Hoyle, the head coach, on January 7.

Dr. J. H. Coffman, Assistant State Veterinarian of the Georgia Department of Agriculture at Atlanta, spent a week in the Veterinary Science laboratories at the University of Wisconsin. The object of his visit was to secure first-hand information relative to the technic employed in conducting some of the newer diagnostic tests for animal diseases that have been developed and perfected at this college. During the years 1915-17, Dr. Coffman was a member of the staff of the Wisconsin Agricultural Experiment Station.

Dean V. A. Moore, on Dec. 20th, gave an address before an audience of 150 at Cortland, N. Y., on the subject "Bovine Tuberculosis and Its Relation to the Community." The meeting was under the auspices of the Accredited Herd Committee, the Cortland County Farm Bureau, and the Holstein-Friesian Association. The *Cortland Standard* published the address in full. Dr. Moore dealt with the early history of bovine tuberculosis, showing that it had its inception in the United States as late as 1870. He emphasized the ways in which the disease had been spread, the relation of the disease to human tuberculosis, and particularly the manner of eradication. He emphasized the value of community spirit in the working of some such plan as the area plan in ridding the cattle of a community of tuberculosis, and thus not only making the milk safer for human consumption but increasing the market for cattle of such an area. Dr. E. V. Moore (Corn. '17) and Dr. L. T. Faulder also gave short talks which were well received.

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 735 Book Building, Detroit, Mich.

C. H. STANGE, President, Ames, Iowa.

M. JACOB, Treasurer, Knoxville, Tenn.

Executive Board

GEC. HILTON, 1st District; T. E. MUNCE, 2nd District; D. S. WHITE, 3rd District;
J. A. KIERNAN, 4th District; C. E. COTTON, 5th District; B. W. CONRAD
6th District; CASSIUS WAY, Member at Large, CHAIRMAN.

Subcommittee on Journal

D. S. WHITE

J. A. KIERNAN

The American Veterinary Medical Association is not responsible for views or statements published in the JOURNAL, outside of its own authorized actions.

Reprints should be ordered in advance. Prices will be sent upon application.

Vol. LXIV, N. S. Vol. 17

March, 1924

No. 6

MORE FINE PUBLICITY

We have just had the privilege of examining a portfolio containing copies of a series of six advertisements placed by the Sioux City Serum Company in a number of farm papers throughout the country. These ads ran from May to November, 1923. The total circulation of the periodicals in which these appeared is estimated at about 450,000.

In many cases the papers cooperated by inserting reading matter in their columns and some by sending marked copies to veterinarians. The publications which carried these ads are: *Nebraska Farmer*, *Nebraska Farm Journal*, *Farmer and Breeder*, *Iowa Homestead*, *Wallace's Farmer*, *Dakota Farmer*, *Duroc Bulletin*, *Poland-China Journal* and *Swine World*.

The advertisements were built around the following slogans: "Have Your Veterinarian Make the Diagnosis," "Corn Belt Prosperity Depends on Veterinarians," "Farmers Lose \$25,000,-000 Each Year from Hog Cholera," "Hog Cholera Must be Prevented, Not Cured," and "Save All Your Hogs."

The Sioux City Serum Company officials were so well pleased with the results of their 1923 campaign that they are now making preparations for a similar campaign this year. Who will be next?

THE WINTER MEETINGS

Although this issue of the JOURNAL is designated the "Index Number," it might well be called our "State Association Number," after a glance at its contents. We are pleased to be able to publish this month the reports of more than twenty meetings of state, provincial and local associations, including several veterinary short courses and conferences.

It will pay every member to read these reports. If you are an officer of an association, you can undoubtedly get numerous suggestions for your future programs, after reading and learning what other associations are having in the way of program material. If you are in the ranks, and for any reason not entirely satisfied with the way your local, state or provincial meetings are conducted, get an inspiration or two from the report of some other association and communicate them to your secretary. If you failed to see a report of your meeting in the JOURNAL, ask your secretary why.

For the first time Alabama and Michigan have put on short courses, in lieu of regular winter meetings. Both were huge successes. Alabama featured practice and Michigan featured meat and milk inspection, and in each instance the attendance was better than anticipated.

The California Practitioners' Week, with Drs. Hall and Ferguson as the attractions, was attended by 106 veterinarians. The Wisconsin Short Course brought out 37.5% of the practitioners in the Badger State, a splendid showing. The Iowa Short Course, with Dr. John W. Adams as the head-liner, brought out a splendid attendance.

The Cornell Conference, the sixteenth to be held, was fully up to the high average established by those of the past. The Conference at the University of Pennsylvania attracted an attendance of over two hundred. The Kansas Conference developed a great deal of enthusiasm and optimism, while the report of the Washington Post-Graduate Course indicates that it struck a responsive chord in the Northwest.

The A. V. M. A. was represented at a number of these meetings. President Stange attended those held in Illinois, Virginia, Ohio, Iowa, Minnesota, Wisconsin and South Dakota, and the Secretary-Editor was present at the meetings held in Illinois, Iowa, Minnesota, Michigan and Kansas. Executive Board members were in attendance at a number of these meetings as well as several others.

Some of our state associations are getting "along in years."

The Illinois, Pennsylvania and Ohio Associations held their forty-first annuals. The New Jersey meeting was the fortieth. Iowa held her thirty-sixth. Michigan will hold her forty-second in June.

HELP OUR LEGISLATIVE COMMITTEE

Our Committee on Legislation is hard at work. Every member of the Association should feel it is his duty to assist the members of our Committee on Legislation in their efforts to secure the enactment of measures designed to benefit the profession. Some of the legislative problems were outlined in the February issue of the JOURNAL. We again ask the support of every member in behalf of the Copeland Bill (S-1671), providing for the compulsory testing of clinical thermometers. If there is any doubt in the mind of any member as to the necessity for something of this kind, read the report on another page of this issue, made by Dr. C. J. Marshall, a member of our Committee on Legislation, after he attended the recent Clinical Thermometer Conference in Washington.

The chairman of our committee, Dr. J. G. Ferneyhough, asks for suggestions relative to legislation that will better control the use of biological products, particularly those containing living viruses. It will be recalled that ex-president Welch, in his address at the Montreal meeting, emphasized the necessity for legislation along this line. Quoting from Dr. Welch's presidential address, he stated:

"Anthrax, blackleg and hog cholera can be kept in a state bordering on complete suppression, but it will never occur so long as vaccines of those diseases are in the hands of the laity. It is therefore imperative, before we can arrive at our highest point of service to the public, that such vaccines, viruses, sera and biologics as are used as diagnostic agents and in combating contagious and infectious diseases, be accessible to none other than veterinarians. It will require time, perhaps, to educate the people to the necessity for such action, but time and experience will ultimately convince all concerned that there is no other way, and that the incompetent county agent and farmer are dangerous and expensive factors in the control and suppression of infectious and contagious diseases of all farm animals."

If you have any opinions as to the advisability of attempting to secure any such legislation at this time, communicate them to Dr. Ferneyhough, at 508 Lyric Building, Richmond, Virginia. While on this subject, we might direct attention to a resolution recently adopted by the Medical Council of the Federation of Medical and Allied Services of Great Britain:

"That the sale of tuberculin and its use for diagnostic or medicinal purposes shall be restricted to qualified medical men and veterinary surgeons."

The demand for legislation to bring the sales and use of tuberculin under Government control is being supported by the Agricultural Committees of County Councils throughout Great Britain, as well as by the National Veterinary Association, but is opposed by the National Farmers Union. Evidently, our confreres across the water are confronted with a problem closely analogous to that existing in this country.

SO IT GOES

It was with a certain degree of satisfaction that we returned from the meeting in Manhattan, Kansas, recently, with three applications for membership. Upon our return to the office three more applications were found in the mail which had accumulated during our five-day absence. However, in the same pile of mail, there were communications advising us of the deaths of six members of the Association. It certainly was an example of six one way and half a dozen the other, leaving our membership just about where it was before we started.

Death is making inroads upon our profession. The report of the Committee on Necrology, presented at Montreal, and to be published in the JOURNAL next month, showed that our Association lost fifty-one by death last year. It is estimated that approximately one-third of the veterinarians in the United States and Canada are members of the A. V. M. A. Assuming that there was the same ratio of deaths among the non-members last year, the total number of deaths in the profession was around 150. Do not forget that less than that number of new veterinarians will be graduated this year from all the veterinary colleges in the United States and Canada.

JUST A COURTESY

Members are requested, when submitting manuscripts of original articles, such as papers and case reports, to advise the editor whether these manuscripts are being submitted for publication elsewhere. This is nothing more than a courtesy due the editor of any publication. This rule, however, does not apply to reports or notices of meetings, short news items, personals, etc. May we have your cooperation in this matter?

THREE ANNOUNCEMENTS

The Rock Island line has been designated as the official route to Des Moines, in connection with the annual convention, August 19-22, 1924.

The Fort Des Moines Hotel has been selected, by the Local Committee on Arrangements, as official headquarters for the convention.

Prospective exhibitors, who wish to secure information relative to space, should communicate with Dr. H. D. Bergman, Iowa State College, Ames, Iowa.

EXECUTIVE BOARD ELECTION

The polls for the Executive Board election being held in District No. 4 will close on March 3, 1924. At this writing the nominations of three members seem assured. The fourth and fifth candidates are in doubt, with five nominees fighting for these two positions. A few votes would assure any one of the five a place on the election ballot, which will be mailed to all members, in the district, in good standing on March 3. The polls will remain open until May 3, 1924.

COMING VETERINARY MEETINGS

New York City Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York City. Mar. 5, 1924.

Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.
Southwestern Michigan Veterinary Medical Association Kalamazoo, Mich. Mar. 12, 1924. Dr. George McCollister, Secretary, Kalamazoo Mich.

Arizona Veterinary Medical Association. Hospital Dr. J. C. McGrath, Phoenix, Ariz. Mar. 15, 1923.

Southeastern Michigan Veterinary Medical Association. Detroit, Mich. Mar. 19, 1924. Dr. H. Preston Hoskins, Secretary, 735 Book Bldg., Detroit, Mich.

Inter-State Veterinary Medical Association. Chamber of Commerce Club, Sioux City, Iowa. Mar. 20, 1924. Dr. P. L. Ellis, Secretary, Merrill, Iowa.

Massachusetts Veterinary Association. American House, Boston, Mass. Mar. 26, 1924. Dr. C. H. Playdon, Secretary, Reading, Mass.

Maine Veterinary Medical Association. Waterville, Me. Apr. 7, 1924. Dr. P. R. Baird, Secretary, Waterville, Me.

A STUDY OF RABIES FROM THE STANDPOINT OF ETIOLOGY¹

By R. A. KELSER, Ph.D., D.V.M.

*Captain, Veterinary Corps, U. S. Army, Army Medical School,
Washington, D. C.*

Rabies or hydrophobia is one of the oldest diseases known to mankind, the history of the malady dating back to the days of Aristotle. The contagious nature of the disease was recognized even in those days, the affection in man being readily associated with the bites of rabid dogs. It was common belief, however, that rabies in animals could develop spontaneously as a result of warm weather, heavy meat diet, lack of drinking water, unsatisfied sexual desire, etc. Even today this old belief, passed along from generation to generation, is still held by a small percentage of the laity.

In 1804, Zinke, studying the disease in dogs, demonstrated the infectiousness of the saliva. It was seventy-five years later, however, before any appreciable amount of research was undertaken by laboratory workers. In 1879, Galtier¹ showed that rabies could be transmitted to rabbits through artificial inoculation, and that they developed the disease in the "dumb" or paralytic form. These findings disclosed a convenient and safe method for the experimental study of hydrophobia, and marked the beginning of more extensive investigation of the malady.

In 1881, Louis Pasteur,² with his associates, Chamberland and Roux, found that the virus of rabies had a special affinity for nerve tissue, it being found concentrated in the central nervous system. During the next few years (1881-1888) the brilliant work of Pasteur,³ which culminated in the perfection of a successful method of immunization against rabies, was accomplished.

In 1903, Negri,⁵ an Italian, of Pavia, Italy, described the finding of a certain type of "body" in the cells of the central nervous system, especially in the large ganglion cells of the hippocampus major, and in the Purkinje cells of the cerebellum, of animals dead of rabies. Negri believed these bodies to be pathognomonic of rabies. In fact he considered them the actual cause of the disease. Confirmation was soon forthcoming as to the presence of these bodies being definitely indicative of hydrophobia. Vol-

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

pino,⁶ D'Amato,⁷ Bertarelli,⁸ Bosc,⁹ Poor,¹⁰ and several other investigators published reports in which they indicated that they had likewise observed the bodies described by Negri. Thus the now well-known method of diagnosing rabies was established, and, in the large percentage of cases, makes time-consuming, animal-inoculation tests unnecessary.

In the same year (1903) that Negri published his findings, Remlinger¹¹ reported that the virus of rabies could be passed through bacteria-retaining filters and, while microscopically and culturally sterile, would still produce the disease. The following year (1904) Bertarelli and Volpino¹² published a report confirmatory of Remlinger's work. In this country the filterability of the virus was demonstrated first by Poor and Steinhardt,¹³ and later by a number of other investigators.

While the specificity of "Negri bodies" for a diagnosis of rabies has been proved beyond all doubt, investigators have become divided in opinion as to the exact relation which such bodies bear to the disease. In this respect, authorities are largely divided into two groups. One group regards the Negri body merely as a peculiar type of cell degeneration, characteristic of rabies, but of no etiological importance. The second group, with Negri, believe that these bodies are not only diagnostic of rabies, but are protozoan organisms and actually the causative factors.

Those who adhere to the opinion that the Negri body is a process of degeneration, in arguing against its being a definite protozoan organism, point to the filterability of the virus; to the absence of Negri bodies in nerve tissue demonstrated to be infectious; and, to the marked scarcity and minute size of the bodies in "fixed-virus" infections, as supporting their contention. On the other hand, those who believe that the Negri body is the inciting factor concerned in rabies point out that these bodies are exceedingly variable in size, and that in some stages of their life cycle it is entirely possible that forms capable of passing bacteria-retaining filters occur. Further, it is argued that these bodies are occasionally seen free, outside of the nerve cells, and that where nerve tissue containing Negri bodies in the cells is triturated and treated with antiformin, microscopic examination will reveal numerous bodies, unaltered in appearance, which have been freed from the cells. Such findings, it is contended, would not be likely were these bodies merely areas of degeneration. Again, their definite outline, regularity of

structure and staining characteristics are referred to as opposing the cell degeneration theory.

In 1906, Williams and Lowden¹⁴ pointed out that they had observed cyclic changes in the bodies described by Negri, and concluded that they were a type of sporozoa and the actual cause of the disease. They proposed that they be called "*Neurocytes hydrophobiae*." Subsequent studies by Calkins¹⁵ lend support to the finding of Williams and Lowden as regards the nature of these bodies. However, aside from Calkins' work, there appears to have been but little published in the way of reports of investigations definitely confirmatory or contradictory of the work of Williams and Lowden.

As might be expected, numerous attempts to cultivate the rabies virus have been made. With one possible exception, nothing of a definite nature has come from such efforts. The exception noted is the work of Noguchi.¹⁶ In 1913, he published a report in which he indicated that he had been successful in cultivating a protozoan-like organism resembling, in some forms, the Negri body. There is, however, a diversion of opinion among scientists as to the significance of Noguchi's findings.

STUDIES MADE AT THE ARMY MEDICAL SCHOOL

During the past two years the writer has devoted considerable time to a study of rabies, especially as regards the nature of the Negri body and its relation to the disease. While the work is still in progress and incomplete, it was thought that a very brief report on some of the results obtained with fixed virus might prove of interest.

While the plan of study involves consideration of both "street-" and fixed-virus infections, the work so far has been largely with the latter. It was decided to give primary consideration to fixed-virus infections for several reasons. First, the period of incubation in rabbits is, with few exceptions, definite and constant, thus offering promise of more accurate results than might be obtained with street virus. Then, as the marked scarcity and character of Negri bodies in fixed virus infection have been frequently held out against the bodies as inciting factors, it was desired, first of all, to make an exhaustive study of the nerve tissue in such type of infection.

In our experiments the procedure has been to inoculate a series of rabbits, subdurally, with a fresh emulsion of the medulla of a virus rabbit, and then destroy one or more of the inoculated

animals at 24-hour intervals for material for study.

The virus employed is known to us as "Fixed Virus Mulford," and is capable of bringing rabbits down with well-marked symptoms of rabies on the seventh or eighth day following inoculation. The inoculum is prepared by emulsifying a small piece of the medulla of a rabbit which has just succumbed to the disease, or which has just been destroyed, with 2 or 3 cubic centimeters of sterile physiological salt solution. This is immediately inoculated subdurally into the experiment rabbits, giving a dose of $\frac{1}{8}$ cc. It is preferable to use at least 16 rabbits in a series. This permits of the destruction of at least two animals every 24 hours up to and including the time of advanced symptoms.

It has been our practice to bleed the animals to death, with a view to having the brain tissue as free of blood as possible. Immediately after death, the brain and cord are carefully removed, and a number of "touch" preparations made from the hippocampus major, cerebellum, cerebral cortex and cord. The staining methods employed include those of Mann, Giemsa, Van Gieson, and Lentz, the first named being used to a greater extent than the other, except where it was desired to study the structure of the bodies in detail.

The procedure followed in making and staining a "touch" preparation may be briefly described as follows: A scrupulously clean, new slide, free from all flaws and scratches, is pressed firmly against a fresh, clean-cut surface of a small portion of nerve tissue, which has been placed on an embedding block, cut surface up. The pressure should be sufficient to cause the tissue to spread out against the slide, leaving a thin, even film of nerve tissue on same when withdrawn. The slides are immediately placed in methyl alcohol for 2 to 3 minutes to fix the films. They are then stained for 15 minutes, when Mann's stain is employed, and washed in distilled water. Next they are passed rapidly through 50%, 75%, 95% and absolute alcohol, and then cleared in xylol. In such preparations the nerve cells stain light blue and the Negri bodies a deep pink. In specimens stained overnight with Giemsa stain, the internal structure of the body can be brought out to better advantage. With this stain the Negri body appears a robin's-egg blue, with its granules staining red.

MICROSCOPIC FINDINGS

Preparations from a total of 64 rabbits, inoculated with fixed virus and destroyed at different periods, have been studied.

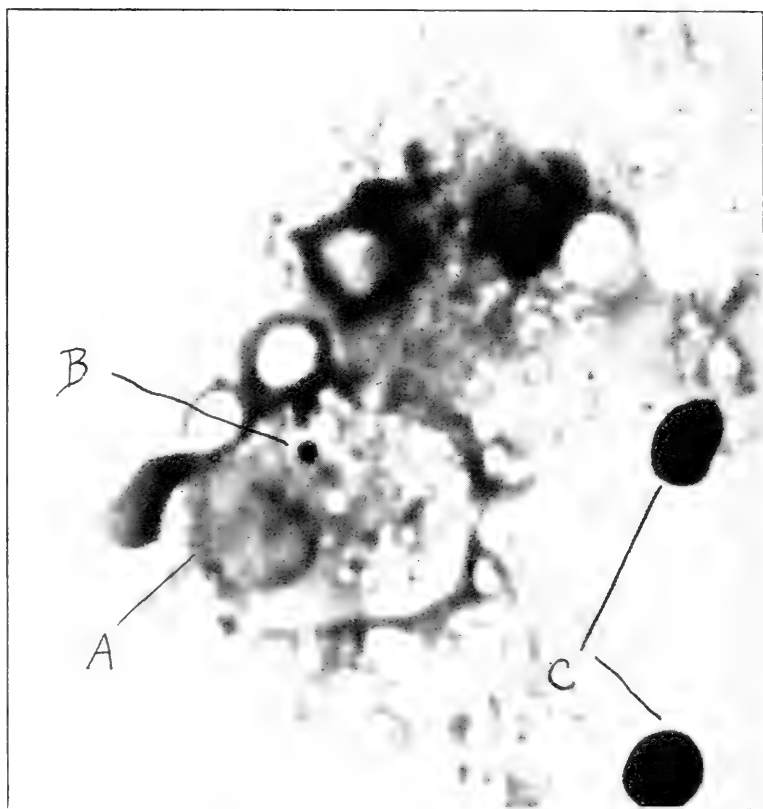


FIG. 1. Preparation from hippocampus major of rabbit V-3, an animal destroyed on third day subsequent to inoculation with fixed virus. A, nerve cell; B, Negri body; C, red blood cells.

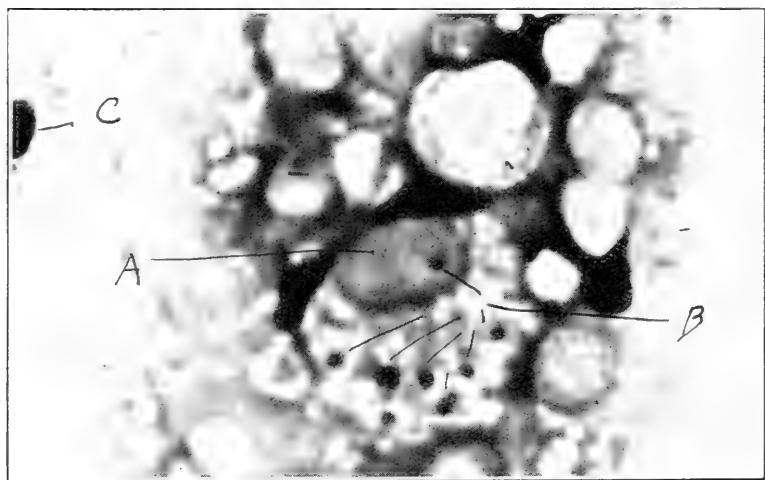


FIG. 2. Preparation from cerebellum of rabbit V-3, an animal destroyed on third day subsequent to inoculation with fixed virus. A, nerve cell; B, Negri bodies; C, red blood cell.

The specimens from rabbits destroyed 24 hours subsequent to inoculation all proved negative.

A microscopic study of the preparations from the hippocampus major and cerebellum of several of the rabbits, destroyed 48 hours after inoculation, revealed a few, minute, highly refractile bodies which stained a very light pink. In a few of these bodies a minute granule, staining blue, was noted. These structures, while all very small, varied somewhat in size. Some were barely

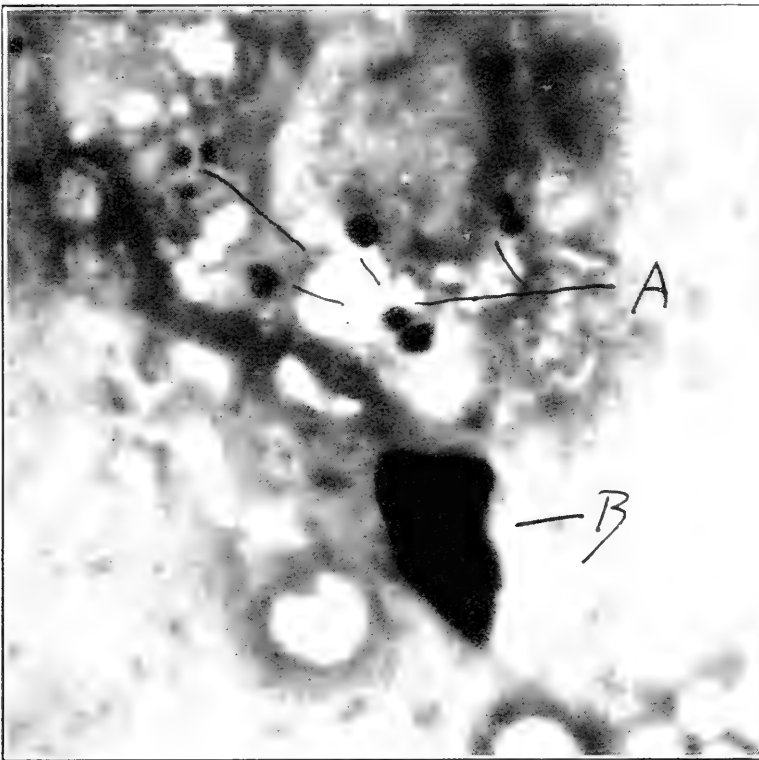


FIG. 3. Preparation from hippocampus major of rabbit D-3, an animal destroyed seventy-two hours subsequent to inoculation with fixed virus. A, Negri bodies; B, distorted red blood cell.

visible, others larger. In most cases they appeared round, but occasionally an oval form was noted. In some instances, on careful focusing, a halo, suggestive of a capsule, appeared around the body. These structures are apparently identical with some of those described by Williams and Lowden. Rabbits inoculated

with an emulsion of the tissue containing these bodies developed rabies.

Preparations from several rabbits destroyed 72 hours subsequent to inoculation have proved to be of great interest. The microscopic examination of films from the cerebellum and the

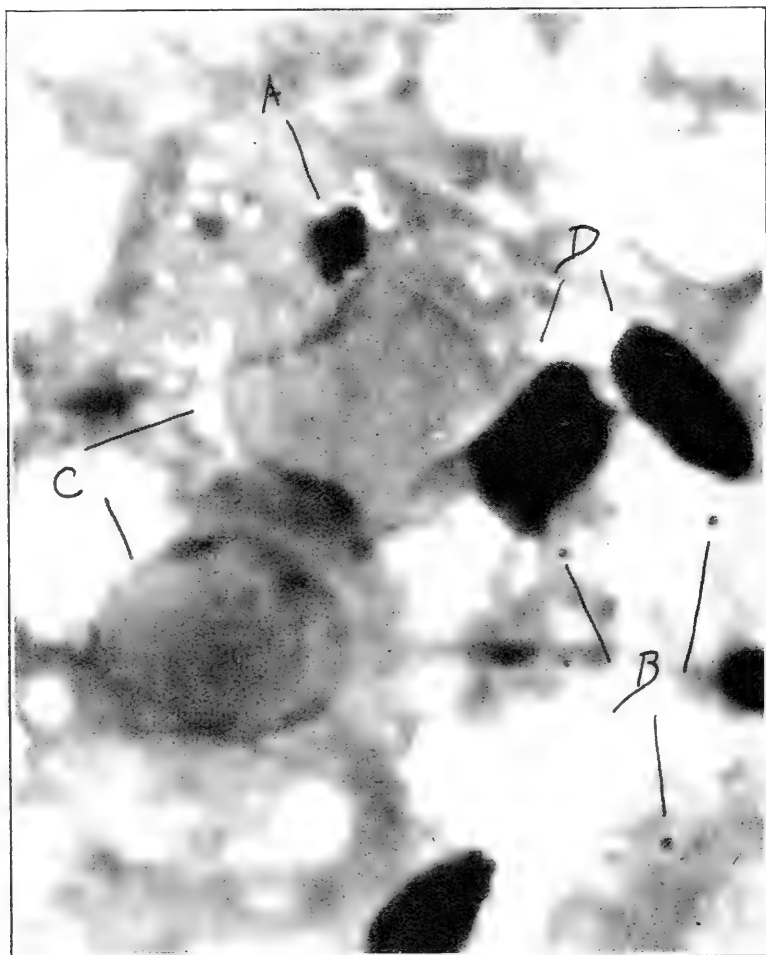


FIG. 4. Preparation from the cerebellum of rabbit V-3. A, group of four Negri bodies apparently just completing division; B, small Negri bodies; C, nerve cells; D, blood cells.

hippocampus major, in these cases, has revealed, in addition to numerous small bodies, a considerable number of larger bodies, having all the characteristics of those described by Negri, undergoing cyclic changes. These bodies appear as large as those

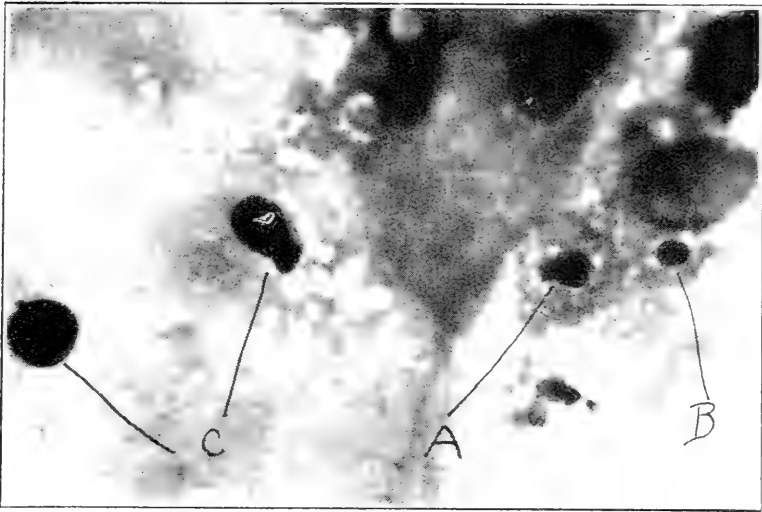


FIG. 5. Preparation from the hippocampus major of rabbit D-3. A, group of Negri bodies undergoing division; B, single Negri body in the process of division; C, red blood cells.

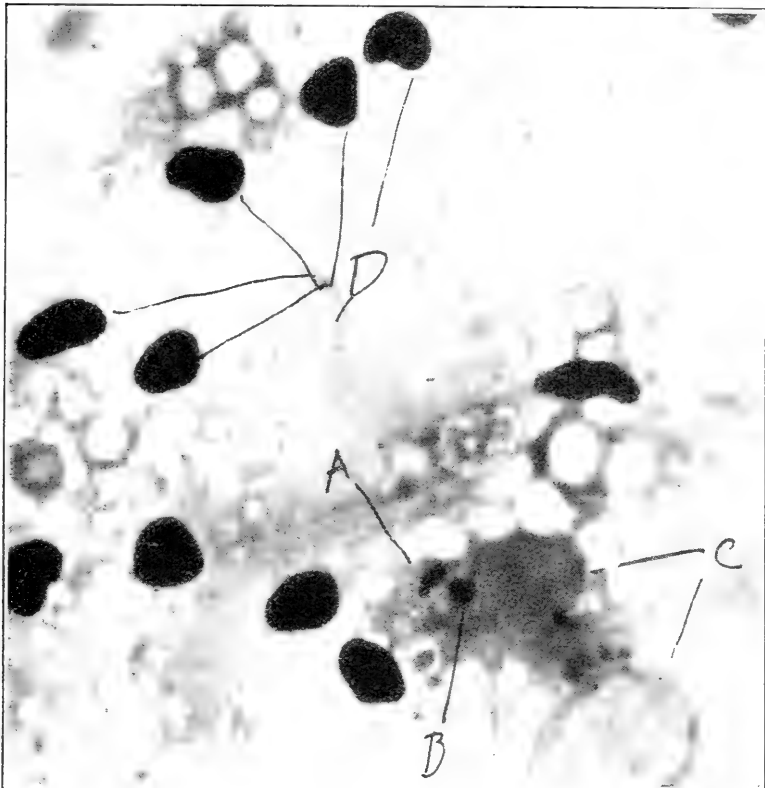


FIG. 6. Preparation from the hippocampus of rabbit F-3. A, chain of three Negri bodies; B, larger Negri body; C, nerve cells; D, blood cells.

commonly found in street virus infection, and, in a number of instances, appear to be dividing by fission. They were found both in and outside of the nerve cells. The small bodies noted were found in rather large numbers throughout some of these preparations. They have the same characteristics as those found in some of the preparations from several of the rabbits destroyed 48 hours after infection. Several fields were found in which the appearance of groups of these small bodies tended to suggest that they had just been liberated from some type of "parent" cell.

I have made some microphotographs of some of the preparations, and have a few lantern slides which I would like to show at this time. I regret that I cannot show these in color. However, the outstanding feature of this work is the demonstration of these large-sized Negri bodies in fixed virus infection, and I believe these slides will be satisfactory for that purpose. So far as I have been able to determine, there have been no previous reports of findings of this particular character in connection with fixed virus infection.

I attempted to photograph some of the minute, refractile bodies for lantern slides, but, unfortunately, did not succeed in getting satisfactory pictures, due to their very small size.

As has been noted, the large bodies were found in the nerve tissue of several of the rabbits which had been infected 72 hours previous to the time of their destruction. One or two of the preparations made from the brain tissue of rabbits destroyed 96 hours subsequent to inoculation revealed an occasional body of the large type. The minute structures were found more commonly. No bodies of the large type have been demonstrated in any of the preparations from rabbits permitted to live more than 96 hours after infection.

While not demonstrated in every case examined, the minute forms were found, irregularly, in specimens from animals representing all periods from 48 hours subsequent to infection up to and including the time of well-marked symptoms and death.

No large forms were noted in preparations from the spinal cords of the various rabbits. The minute bodies, however, were demonstrated in a number of such preparations. Small forms only were noted in the preparations from the cerebral cortex.

SUMMARY AND CONCLUSION

A microscopic study of the tissue of the central nervous system of rabbits inoculated subdurally with fixed virus has

demonstrated, 72 hours after such inoculation, bodies having the morphological and staining characteristics of Negri bodies, undergoing cyclic changes. These bodies appear as large as those commonly noted in street virus infection, and were found dividing by fission. Another type of minute, highly refractile body, similar to that described by other investigators, was found in considerable numbers 48 hours and later, subsequent to infection. The grouping of these small bodies, in several instances, suggested that they had possibly just been liberated from some type of "parent" cell.

At the present time, scientific authority is divided on the relationship of Negri bodies to rabies, some holding that these bodies are the cause of the disease, others maintaining that, while they are diagnostic of the malady, they are merely small areas of cell degeneration and thus not the etiological factor.

The findings herein reported deny the theory that Negri bodies are processes of degeneration, and lend support to the contention that they are a type of protozoan organism primarily responsible for the disease.

LITERATURE

- ¹Galtier: (1879) *Compt. rend. de l'acad. des sciences*. LXXIX, p. 444.
- ²Pasteur, Chamberland & Roux: (1881) *Compt. rend. de l'acad. des sciences*, XCII, p. 159.
- ³Pasteur: (1882) *Compt. rend. de l'acad. des sciences*. 84, 85 and 86.
- ⁴Idem: (1887-1888) *Ann. de l'Inst. Pasteur*.
- ⁵Negri: (1903) "Beitrag zum Studium der Aetologie der Tollwuth," *Zeitschrift für Hygiene und Infektionskrankheiten*, 43, p. 507.
- Idem: (1903) "Zur Aetologie der Tollwuth: Die Diagnose der Tollwuth auf Grund der neuen Befunde," *Zeitschrift für Hygiene und Infektionskrankheiten*, 44, p. 519.
- ⁶Volpino: (1903), *Giorn. d. r. Accad. d. med.*, Torino, 14, p. 228.
- ⁷D'Amato: (1904), *Riforma med.*, 20, p. 617.
- ⁸Bertarelli: (1906) "Die Negri'schen Körperchen im Nervensystem der wutkranken Tiere, etc." *Centralbl. f. Bakteriol.* 37, p. 556.
- ⁹Bosc: (1903) "Recherches sur l'etologie de la rage," *Compt. rend. d. l. Soc. d. Biol.*, 55, p. 1436.
- ¹⁰Poor: (1904) "Pathological Studies in Rabies," *Proc. N. Y. Path. Soc.*, p. 101.
- Idem: (1905) "Recent Studies in the Diagnosis of Rabies," *Med. Rec.*
- ¹¹Remlinger: (1903) "Le passage du virus rabique a travers les filtres," *Ann. de l'Inst. Pasteur*, XVII, p. 834.
- ¹²Bertarelli & Volpino: (1904) *Centralbl. f. Bakteriol.*, lte Abt. Orig., XXXVII, p. 51.
- ¹³Poor & Steinhardt: (1913) "Two Methods for Obtaining a Virus of Rabies, Freed from the Cells of the Host and from Contaminating Organisms, and the Application of these Methods to other Filterable Viruses or Glycerin-Extracts," *Jrn. Inf. Dis.*, XII, p. 202.
- ¹⁴Williams & Lowden: (1906) *Proc. N. Y. Path. Soc.*, 1906, *Jrn. of Inf. Dis.*, Vol. 3, p. 452.
- ¹⁵Calkins: (1906) *Proc. N. Y. Path. Soc.*
- ¹⁶Noguchi: (1913) "Contribution to the Cultivation of the Parasite of Rabies," *Jrn. Exp. Med.*, Vol. 18, p. 314.

DISCUSSION

DR. A. EICHORN: Mr. President, I think Capt. Kelser's paper is of very great interest to those who have worked on rabies; particularly so with regard to the etiology of the disease. The contention that the Negri bodies are the causative factors of rabies is now more or less generally accepted. However, some still maintain that they represent only degenerative processes in the central nervous system; particularly so in the nerve cells.

I think the microphotographs which were thrown on the screen here seem to indicate that there occurs some change in these bodies during certain periods, which in the paper were described as probably being divisions and representing the multiplication of the Negri bodies. I don't think that Capt. Kelser fully proved that contention, with the exception that he showed these bodies to divide or apparently divide, but it is possible that the micro-

photographs have not reproduced the true picture as distinctly as in the stained preparation.

However, the most interesting feature is that the bodies occurred in the brain cells of rabbits only three days infected. It seems that in animals under natural conditions the symptoms appear usually when the Negri bodies are already recognizable in the central nervous system. In dogs particularly we always thought that the first symptoms developed after the central nervous system has been invaded by the Negri bodies; that is, after the Negri bodies are recognizable in the nerve cells.

In this instance, however, as Capt. Kelser pointed out, there were practically no symptoms, and apparently the Negri bodies were present there in considerable numbers. So that this is contrary to our former belief, and I think that is very interesting, because it might throw an entirely new light as to the invasion of the Negri bodies in the brain or the central nervous system and their relation to the lesions that are producing symptoms in the animal.

I certainly would like to know if Capt. Kelser could give us the information as to what the proportion of the infestation of the nerve cells was on the third day in the rabbits, as compared with ordinary brains examined after the animal died from the natural infection, or artificial infection, for that matter. (Applause.)

DR. FRANK W. SCHOFIELD: I would like to emphasize what Dr. Eichhorn has said with regard to the street type of rabies and the fixed-virus type. In dogs' heads that we get from the street type of rabies, one finds that if the animal has been killed early in the disease, there is great difficulty in finding Negri bodies, whereas, if it is killed late in the disease, they are found almost always quite easily; in fact, we advised veterinarians to tie up dogs which showed symptoms of the disease, and, if the animal died, to forward the head to the laboratory. In such cases, after death, the Negri bodies could almost always be found; whereas if the animal is killed in the early stage of the disease, one will have to hunt the Negri bodies for a long time, and even then frequently fail to find them. According to Capt. Kelser, in fixed virus, the reverse seems to be the case, and after the seventy-second hour they seem to be very numerous, disappearing as the disease progresses. That is one thing which it is very difficult to understand.

If the Negri bodies are degeneration bodies and they are well marked at the seventy-second hour, ought not the brain cells to show marked degeneration at the termination of the disease? What is the picture of the brain cells at the time the rabbit dies? If the bodies are parasites, the cells of the brain might have escaped some very marked degenerative changes. Why is it that in "dumb" rabies we have such difficulty in finding Negri bodies, as well as in the brain cells of human beings? We rarely find Negri bodies in "dumb" rabies, while in street rabies they are constantly found.

DR. E. M. PICKENS: I would like to ask Capt. Kelser if he has done any work on the ganglia and the salivary glands?

MR. J. M. WHITTLESEY: I would like to ask Dr. Kelser if he has done anything that would show the period of incubation after the first biting; how soon the dog would become infectious after he had been bitten? We have so many instances where the first noticeable effect of the disease is in the dog in turn biting other dogs.

DR. R. A. KELSER: In reply to Dr. Eichhorn's question, I might say that the percentage of Negri bodies in the preparations from animals destroyed 72 hours after infection was greater than in preparations from rabbits permitted to die of fixed-virus infection. The few slides which I have here are but representative of a number of fields noted in the microscopic slides from the 72-hour preparations. From the standpoint of demonstrating the cyclic changes, possibly I do not have the best photographic preparations. We selected, for microphotographs, fields in the preparations which we thought would stand out best, that is, fields which did not contain large numbers of nerve and blood cells. In so doing, we probably sacrificed some of the best fields.

The small number of Negri bodies in fixed-virus infection has been, as I pointed out early in my paper, one of the outstanding facts in fixed-virus

infections. The Negri bodies are few in number and very minute in size. As a matter of fact, some investigators have doubted that true Negri bodies occur in fixed-virus infection, maintaining that the minute structures observed are not typical Negri bodies.

In answer to Dr. Schofield's question, it is, of course, a well-recognized fact that in street-virus infection the Negri bodies are found most numerous in the latter stages of the disease. As previously pointed out, in preparations from rabbits dead of fixed-virus infection, or in the late stages of the fixed-virus disease, Negri bodies are very rare. Now, as to our findings in the brain-tissue preparations from the rabbits destroyed 72 hours subsequent to infection with fixed-virus, we want to avoid what might be looked upon as far-fetched conclusions. However, to theorize a little, we feel that the situation might possibly be explained as follows: We presume the Negri body, occurring in various sizes, from ultramicroscopic to the very large forms, to be the cause of rabies. In the brain tissue of rabbits dead of fixed-virus infection, the ultramicroscopic and minute forms occur, possibly because of the rapid course of the disease in such type of infection. Now then, when such fixed virus is injected into a rabbit, it occurred to us that the various minute bodies thus injected, might immediately start to develop in the favorable areas of the nerve tissue, and then later produce their progeny. We feel that possibly the large forms noted in the 72-hour preparations were not forms originating from the virus introduced but were later stages of the initial virus, and that such bodies would later produce progeny in sufficient numbers and of such character as to produce the disease. In fixed-virus infection, it is possible that, because of the rapid course of the disease, the progeny of the virus originally introduced do not have time to develop into the larger forms but are present as ultramicroscopic and barely visible forms. On the other hand, with street-virus infections, the presence of the large forms of Negri bodies may be due to the longer course of the disease, the progeny of the infecting virus having more time to develop.

As Dr. Schofield pointed out, if the Negri body is an area of cell degeneration, the process should be more marked at the end of the disease than at the seventy-second hour. Such is not the case.

So far as the Negri bodies in "dumb" rabies go, I cannot say just why you find that Negri bodies are scarce in that type of the disease.

Regarding Mr. Whittlesey's question as to the infectiousness of the saliva previous to the time that an animal develops the disease, it has been definitely shown that the saliva is virulent from two to five days previous to manifestations of symptoms. In going through the literature on that point, I found some work reported, I think by someone from the Pasteur Institute, in which it was proved that the saliva was virulent eight days previous to the manifestation of symptoms; but that is unusual.

As to Dr. Pickens' question, I might say that we have started some work along the line indicated, but have no results to report at this time.

HANDBOOK ON FEEDING

Veterinarians in every agricultural section of the country should be interested in the new publication, "A Handbook for Better Feeding of Live Stock," just issued by the United States Department of Agriculture, as a part of a recently organized service for better feeding methods. This booklet contains in condensed form practical and up-to-date information on the feeding of cattle, hogs, sheep, horses, and poultry, compiled as a result of a country-wide study of farm feeding problems. Copies of the handbook, which is known as Miscellaneous Circular 12, may be obtained free, as long as the supply lasts, by addressing the Department of Agriculture, Washington, D. C.

PROPHYLACTIC RABIES IMMUNIZATION BY THE ONE-INJECTION METHOD

By A. EICHHORN and B. M. LYON

Pearl River, New York

It is a recognized fact that the dog is the primary factor in the propagation and dissemination of rabies, and therefore the elimination of the disease from the dog would naturally tend to control and eradicate the disease. Measures of quarantine and muzzling, which have been practiced in practically every country where rabies is prevalent, have not effectively prevented the spread of the infection, nor did such measures even markedly diminish the number of cases in localities where the disease prevails.

Effective vaccination against rabies has been practiced ever since the epoch-making discovery of Pasteur. Many modifications have been developed, but, in all instances, a series of anywhere from 14 to 25 injections is required to confer protection to the individual. These vaccinations have been more or less limited to persons exposed to the infection through bites by rabid dogs or other animals, and only in exceptional cases have they been utilized for the protection of animals which have been exposed to the disease. The modification of the Hogyes method (dilution method), requiring six injections, has been quite extensively employed for the vaccination of animals which have been exposed to the infection, and markedly good results thus obtained with this method. The statistical data is available now on over 15,000 such vaccinations on different species of domestic animals, with only one and one-half per cent of failures. These are splendid results when we come to consider that in many cases the treatment was undertaken a considerable time after the exposure of the animals.

Any methods necessitating several injections in order to produce immunity could not be recognized as a practical procedure for the immunization of such animals which were not exposed to the disease through bites from infected animals, and it would require a much simpler procedure to popularize it with dog owners in order that they may be induced to protect the dogs against the disease by periodical vaccination.

Received for publication December 24, 1923.

The very thorough and extensive investigations of Umeno and Doi have proved that it is possible, by a single injection of a specially prepared vaccine, to produce an immunity which would protect animals against even artificial infection with street virus. This method has been applied extensively and most successfully in practice in Japan.

According to the original report of Umeno and Doi, 31,307 dogs were vaccinated in the Prefectures of Kanagawa and Tokio, with the results that only one animal died from accidental causes following vaccination, and in only one case did the vaccination fail in producing a sufficient immunity against natural exposure. On the other hand, the disease continued to rage among the unvaccinated animals. The vaccination in these two prefectures resulted in a 75% reduction in the number of cases of rabies, the disease occurring only in the dogs which were not immunized.

The laboratory experiments have also conclusively established the safety and potency of the vaccine. The vaccine is prepared by collecting and grinding the brain and spinal cord of a rabbit in which rabies developed in seven days from the injection of fixed virus. To this amount four times its volume of phenolized, glycerin-saline solution is added. The glycerin-saline solution consists of sixty parts of glycerin to forty parts of normal salt solution containing 1.25% phenol. This mixture was called the original vaccine, and was stored at room temperature of 18° to 22° C. for two weeks, or in an ice chamber 30 days to reduce its virulence. When first used, this vaccine was diluted to one-twentieth, but later it was given in a dilution of 1 to 4, that is, in its original strength. This vaccine can be stored much longer than ordinary rabies vaccine, and from data available it will remain active two to three months at room temperature.

When the experimental work was done, the dosage ranged from a fraction of a cubic centimeter up to six cubic centimeters, and the number of injections from four to one, and a dilution of from one-twentieth to one-fifth of the original vaccine to the concentrated original vaccine itself, which is diluted to one-fifth or 1 to 4. It was finally established that one injection of five cubic centimeters per 15 kilograms weight of one-fifth dilution should be used, and that for puppies of 4½ kilograms or less, three cubic centimeters should be given.

The results obtained in Japan were so conclusive and the experimental data so convincing that the authors undertook a

series of experiments to determine whether all the claims made could be substantiated. First, it was undertaken to establish more accurately the duration of immunity induced by such vaccination, and also the relation of the age of the vaccine to the degree of immunity produced. In the April, 1922, issue of the *Journal of the American Veterinary Medical Association*, the authors published the results of a single immunization experiment on dogs, which fully confirmed the results obtained by the Japanese investigators. Since that time the experiments outlined for this work have been completed and tabulated.

The dogs employed in these experiments were obtained from various pounds, but were not selected as to age or breed. They, however, were selected for the respective experiments as uniform in size as was possible under the circumstances. Toward the conclusion of the experiments, as noted from tables IV and VI, only four and five dogs were used respectively, due to the fact that scabies developed among the animals, and; in spite of careful treatment, some of the animals died, as a result of which a smaller number of vaccinated dogs was available for the last experiments. In the preliminary experiments the writers found that it is very essential to employ for the infective inoculations of the dogs a street virus of a somewhat modified virulence which has been successfully obtained by employing a virus which was glycerinated from three to six weeks. The medullae oblongatae of dogs, proven infective, obtained either from outside sources or from our own control animals, were placed in glycerin. For infective purposes small sections from the glycerinated medullae of different dogs were cut with a scissors into fine segments and thoroughly ground in a small amount of saline solution in a mortar. More solution was gradually added until about 10 cubic centimeters were added to one gram of the brain material. This suspension was then filtered through a double layer of cheese-cloth and used for injection purposes.

All infective injections were given intraocularly, the puncture having been made at the juncture of the cornea and sclera into the anterior chamber of the eye; thus the flow of the virus into the eye could be readily followed. Immediately after withdrawal of the needle slight pressure was exerted upon the point of injection to prevent the escape of any of the aqueous humor. Only in two instances did we note a permanent injury to the eye from this injection. As a rule the absorption is very rapid,

and the eye invariably clarifies within two to three days following the injection.

All dogs were vaccinated in the routine manner by injecting the vaccine at two points under the skin of the shoulder and neck. We have not observed a single instance in which any ill effects followed the administration of the vaccine. The control dogs were placed in special individual cages, whereas all vaccinated dogs for each experiment were kept in one pen. As recorded in the tables, all control dogs developed the disease in the majority of cases from 15 to 17 days, which proved that the injected dose of the street virus was of sufficient virulence.

The diagnosis of rabies in all animals was verified by microscopical findings and inoculation of rabbits. All vaccinated and subsequently infected animals were kept alive for a period of six months, when they were destroyed.

The writers have aimed in conducting the experiments to exercise the greatest care and precautions. A special attendant was also provided to care for these animals, in order that they might be carefully observed.

The effectiveness of the vaccination, as indicated in the tables, is apparent. All vaccinated dogs with the exception of

TABLE I.—RABIES IMMUNIZATION TESTS 25 DAYS FOLLOWING VACCINATION

Dog No.	Date Vaccinated	Amount Injected Subcut.	Lab. No. Vaccine	Street Virus Injected Intraocularly	Amount	Results
1	10/4/21	5 cc	16	10/29/21	0.05 cc	Living
2	"	"	"	"	"	"
3	"	"	"	"	"	"
4	"	"	"	"	"	"
5	"	"	"	"	"	"
6	"	"	"	"	"	"
7	Control			"	"	Died 11/13/21 R.*
8				"	"	" 11/14/21 "
9				"	"	" 11/15/21 "

*R = Rabies.

TABLE II.—RABIES IMMUNIZATION TESTS 3 MONTHS FOLLOWING VACCINATION

Dog No.	Date Vaccinated	Lab. No. Vaccine	Date Prepared	Amount Injected	Street Virus Injected Intraocularly	Amount	Results
1	11/15/22	67V160	10/17/22	5 cc	2, 20, 23	0.05 cc	Living 5/6/23
2	"	"	"	"	"	"	"
3	"	"	"	"	"	"	"
4	"	"	"	"	"	"	"
5	"	"	"	"	"	"	"
6	"	"	"	"	"	"	"
7	"	"	"	"	"	"	"
8	Control			"	"	"	Died 3/1/23 **
9				"	"	"	Died 3/6/23 R.*
10				"	"	"	" 3/10/23 "
11				"	"	"	" 3/22/23 "

**Pneumonia the cause of death.

*R = Rabies.

TABLE III.—RABIES IMMUNIZATION TESTS 7 MONTHS FOLLOWING VACCINATION

Dog No.	Date Vaccinated	Lab. No. Vaccine	Date Prepared	Amount Injected	Street Virus Injected Intraocularly	Amount	Results
1	10/24/23	67V160	10/17/23	5 cc	5/24/23	0.05 cc	Living
2	"	"	"	"	"	"	"
3	"	"	"	"	"	"	"
4	"	"	"	"	"	"	"
5	"	"	"	"	"	"	"
6	"	"	"	"	"	"	"
7	"	"	"	"	"	"	"
8	Control				"	"	Died 6/14/23 R.*
9					"	"	" 6/11/23 "
10					"	"	" 6/17/23 "

*R = Rabies.

TABLE IV.—RABIES IMMUNIZATION TESTS 12 MONTHS FOLLOWING VACCINATION

Dog No.	Date Vaccinated	Lab. No. Vaccine	Date Prepared	Amount Injected	Street Virus Injected Intraocularly	Amount	Results
1	10/22/22	67V160	10/17/22	5 cc	10/5/23	0.05 cc	Living
2	"	"	"	"	"	"	"
3	"	"	"	"	"	"	"
4	"	"	"	"	"	"	Died 10/22/23 R.*
5	Control				"	"	Died 10/18/23 R.*
6					"	"	" 10/21/23 "

*R = Rabies.

TABLE V.—RABIES IMMUNIZATION TESTS WITH 3-MONTHS-OLD VACCINE

Dog No.	Date Vaccinated	Lab. No. Vaccine	Date Prepared	Amount Injected	Street Virus Injected Intraocularly	Amount	Results
1	5/3/23	67V172	1/23/23	5 cc	5/24/23	0.05 cc	Living
2	"	"	"	"	"	"	"
3	"	"	"	"	"	"	"
4	"	"	"	"	"	"	"
5	"	"	"	"	"	"	"
6	"	"	"	"	"	"	"
7	"	"	"	"	"	"	Died 6/12/23 R.*
Controls**							

*R = Rabies.

**The experiment recorded in the above table was carried out simultaneously with the one recorded in table III. The same infective street virus was used for all dogs in tables III and V and therefore the controls of table III served also as controls for table V.

TABLE VI.—RABIES IMMUNIZATION TESTS WITH 6-MONTHS-OLD VACCINE

Dog No.	Date Vaccinated	Lab. No. Vaccine	Date Prepared	Amount Injected	Street Virus Injected Intraocularly	Amount	Results
1	8/6/23	172	2/4/23	5 cc	8/27/23	0.05 cc	Living
2	"	"	"	"	"	"	"
3	"	"	"	"	"	"	"
4	"	"	"	"	"	"	"
5	"	"	"	"	"	"	Died 9/14/23 R.*
6	Control				"	"	Died 9/12/23 R.*
7					"	"	" 9/13/23 "

*R = Rabies.

three withstood the intraocular injection of the virulent, street virus. It must be further considered that dogs under natural

conditions would not be exposed to such large amounts of virus as used in this experimental work.

An interesting observation was made in connection with the development of the disease in one of the control dogs in table II. This dog, not having shown any signs of rabies up to the twentieth day after receiving the injection of virulent virus, was placed in the pen with the seven vaccinated dogs. On the twenty-eighth day after the infection he showed the first indication of rabies, and within a few hours developed a furious attack, during which he bit every animal in the cage, some of them quite severely. Sixteen hours after the initial symptoms paralysis became very marked, convulsions followed each other with great frequency and death resulted in thirty-six hours from the onset of the disease.

We anticipated the additional exposure of the seven vaccinated dogs, through the bites of the rabid dog, and although we did not expect that this would induce the development of the disease, due to the fact that all of these dogs received the fixed virus, nevertheless it was deemed interesting to subject these animals, if possible, to such additional exposure. All the vaccinated dogs, however, remained in good health, showing that the vaccination protected them not only from the artificial inoculation with the virus, but also from the additional exposure of bites from the rabid dogs.

As shown in table VI, another of the vaccinated dogs developed rabies, and, as before stated, the vaccinated dogs all being kept together in one pen, the natural sequence happened. This one rabid dog was a very large Airedale, much larger than the other four, and while in the furious stage of the disease he bit each of the other four dogs badly. The whole four of them were smeared with blood, two having their ears split and the other bitten badly about the head and legs. In spite of this additional exposure, none of the four dogs developed the disease, which is again proof that the vaccination will protect against both the natural and artificial infection.

Experience in practice with the vaccination against rabies by the single-injection method has also confirmed the experience gained from the experiments. Thus far they include statistics on about 25,000 dogs which have been given the single vaccination against rabies. None of these animals developed the disease. It should be considered, however, that no data is available to establish how many of these animals were exposed to the disease.

Conclusive evidence has been furnished in several instances where vaccinated dogs were bitten by known rabid dogs without developing the disease. Thus, the *New York State Journal of Medicine*, in the May, 1923, issue, cites cases from Connecticut in which vaccinated dogs have been bitten by a rabid dog and none has developed rabies, and also an incident when a known rabid dog bit two unvaccinated dogs and one vaccinated dog. The two unvaccinated dogs developed rabies, and the vaccinated dog did not develop the disease. The results in practice are significant, especially so as the vaccinations were undertaken principally in localities where rabies was prevalent.

The advantages of an effective, protective vaccination against rabies are of great importance, not only from an economic and police standpoint but also for public health reasons.

YE ANCIENT VET

In olden days, when violet rays
And serums were unknown;
The "Vet" chewed Climax and told big yarns,
While exuding odors of the livery barn.
Prating of prowess and wide renown
That even extended to the neighboring town;
Of successful practice, with clamp and shears,
As he treated himself with dark brown beers.
If you had a sick cow he could relieve her
With aloes, oil or nitrous ether.
He expelled the bots from their nice warm lair,
With turpentine and chopped-up hair.
"Wolf in the tail" and "hollow horn"
Were mysteries that caused him to look forlorn;
While with "water colic" that caused unrest,
He treated with nitre and appeared at his best.
The "profession" to him was but a trade,
The foundation of which was laid
In legend and mystery handed down;
Only to be grasped by minds profound.
Shot-gun prescriptions, and obnoxious mixtures
Of deadly nostrums and potent elixirs.
But at that I wonder, if our educated blunders,
Aren't just as bad or worse.

W. C. NYE.

Boise, Idaho.

LOS ANGELES COUNTY, CALIFORNIA, ADOPTS ANTI-RABIES VACCINATION ORDINANCE

By T. H. EDWARDS, Pasadena, Calif.

Director of Rabies Control, Los Angeles County Health Department

Los Angeles County, including the city of Los Angeles and some thirty or more other municipalities, reported 808 positive cases of rabies during the year 1923 among dogs and other domestic animals and nine human deaths resulting from bites of rabid dogs.

Due to the mild climate and unusual liberty permitted the dwellers in Southern California, where each citizen lives in a yard of his own, the disease occurs just as unabated in December and January as in July and August. Almost every family has a dog, a large percentage of which are of the better class, and each one is allowed as much freedom of movement as possible. Among the one million and a quarter of people in the county there are approximately 50,000 dogs, 20,000 of which are in the city of Los Angeles alone. The incidence of the disease and its menace to the public health have become so great and the apprehension produced by it so terrifying that the Board of Supervisors of the county were stirred to action and passed an ordinance on December 24, 1923, requiring that every dog going free on the public domain must be immunized against rabies by treatment with rabies vaccine (canine).

Dr. J. L. Pomeroy, County Health Officer, Los Angeles County, was charged with the duty of eradication of the disease and pursuant to that end he has put the burden of the task upon the shoulders of the veterinary profession of Los Angeles County and has deputed every veterinarian licensed under the Veterinary Practice Law of the state of California as an assistant. The county will be divided into zones with pound organizations located centrally in each zone. Lay quarantine officers will make a census of the dogs and require each owner to present his dog to a veterinarian for immunization, after which the county will issue serially-numbered tags indicating that the dog has been so treated. At a given date, ninety days after notice to start immunization each year, quarantine will be placed on, and a clean-up made of all unvaccinated and stray dogs. It is hoped that within two years rabies among domestic dogs, will have

been so controlled that a campaign of extermination of the coyotes in the mountain districts of the county, among which rabies is enzootic, may be put on and thus terminate the menace to the public health.

Although not the pioneer in anti-rabies immunization in this country, it is anticipated that the movement inaugurated in Los Angeles County is one of the first really large propositions in the modern method of rabies control. That the members of our sister medical profession, through a high ranking public health officer, has recognized our Veterinary Medical Association and the veterinary profession as the back-bone of the campaign, is a high compliment to our professional efficiency and a tremendous stimulus to the individual practitioner to do his patriotic bit in the interest of his country and the public health.

In the passage of this ordinance four new veterinary positions have been created at substantial salaries, a Veterinary Director and three Assistant Veterinarians being authorized, thus placing the work as nearly exclusively a veterinary activity as possible in a health department subordinated only to the County Health Officer.

The Veterinary Association of Southern California unanimously passed a motion, at its December meeting, establishing a uniform fee for anti-rabies vaccination at \$2.50, thus publishing to the public that the ordinance passed was not a political gouge to enrich the practitioner, a cry so often heard from the anti-vivisectionist, anti-vaccinationist and all of the other anti-cults and isms.

That we, as a profession, merit the trust imposed in us in carrying out this very important health measure is obvious and it is hoped that every member will strain to his professional utmost to eradicate the dread disease of rabies, thus rendering our beloved profession less hazardous in earning our daily bread.

A CORRECTION

Dr. James W. Benner desires to direct attention to an error which crept into the manuscript of his paper, "Immunizing Young Pigs Against Hog Cholera," published in the January issue of the JOURNAL. In table I, on page 467, in the box-head at the top of column 4, the time should be "5 months, 3 weeks" instead of "3 months, 3 weeks," as printed.

ACUTE PARENCHYMATOUS MASTITIS, WITH SPECIAL REFERENCE TO ETIOLOGY AND PATHOLOGY¹

By G. E. JORGENSEN, *Clermont, Iowa.*

Acute parenchymatous mastitis is a disease of considerable importance both economically as well as a problem of public health. It annually causes monetary losses of considerable import by its destructive effect upon the organs of lactation. Equally, if not more important, is the possibility of its transmission to human consumers of milk. An example of this nature is had in the epidemic of streptococcic sore-throat in Portland, Oregon, in 1922, in which 487 cases with 22 deaths were traced to a single dairy in which a cow was suffering from streptococcic mastitis which had without doubt been transmitted to the gland from the hands of one of the milkers who was suffering from sore-throat due to a streptococcus identical to the one isolated from the cow and from the patients affected during this epidemic.

ETIOLOGY

The predisposing factors of a mammary gland infection are not dissimilar to predisposing factors in other infections. Most of the pathogenic organisms are able to produce an infectious, parenchymatous mastitis. However, the organisms that are usually found are in the following order of frequency: Streptococci, staphylococci, colon bacilli, *B. tuberculosis* and *B. pyogenes*.

It is possible that in some instances the organisms arrive at the mammary gland via the blood stream, yet it is probable that by far the most frequent avenue of entrance is the teat canal. The source of the invading organisms varies. I have noted a correlation, as it were, between the organisms found in septic genital infections and those found in cases of mastitis in the same herd. In mastitis due to streptococci of human origin it is no doubt transmitted by an infected milker, while the source of colon bacilli, staphylococci, etc., needs no explanation.

Records of etiological studies by the writer over a period of six years covering 44 cases show the following organisms and their frequency:

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

Alpha-type streptococci.....	30 cases
Beta-type streptococci.....	4 cases
Staphylococci.....	2 cases
<i>B. coli communis</i>	3 cases
<i>B. coli communior</i>	2 cases
<i>B. pyogenes</i>	1 case
<i>B. tuberculosis</i>	1 case
<i>Actinomyces bovis</i>	1 case

In one case where a Beta-type streptococcus was found in pure culture the owner's children were suffering from a streptococcic sore-throat. In one case where *Staphylococcus albus* was isolated the owner who did the milking was affected with a *Staphylococcus albus* abscess of the wrist. In summing up the etiological factors of acute parenchymatous mastitis it can be said without fear of successful contradiction that streptococci are by far the most frequent invaders and incidentally the most dangerous, for the reason that bovine streptococci are potentially virulent for human beings and in the ordinary routine practice it is difficult for the practitioner to ascertain whether he is dealing with an infection of human origin or one of more lowered virulence of bovine origin.

PATHOLOGY

My classification of the injury produced may be somewhat arbitrary so far as the usual classification is concerned. I consider acute, parenchymatous mastitis as a purulent phenomenon, and limit the classification to the tissue attacked, that is, to acute, parenchymatous mastitis or chronic, interstitial mastitis. The end-results vary. There may be a resolution and regeneration of the destroyed parenchymatous tissue, if the process is limited, or, if extensive, a replacement with connective tissue of fibroblastic origin. In cases where the process is extensive, with saturation of the tissue with powerful toxins, the end-result may be one of local necrosis, together with grave systemic toxemia.

I have never had the opportunity of seeing the lesions of acute, parenchymatous mastitis shortly after its inception. Such cases as have come to necropsy, or such materials as have been available for study following surgical removal, have always been from cases of some length of duration. The lesions noted have been the usual, retrograde changes seen in any destructive process of glandular tissue. The lesions vary from simple,

granular degeneration, at one end, to necrosis and exfoliation at the other extreme. A section under the microscope on the table before me shows exfoliated necrotic cells, cells showing pyknosis, karyorrhexis and fat, together with an infiltration with polymorphonuclear leucocytes, some of which contain cocci. There is a fibrinous exudate and intense congestion of the adjacent vessels. This is from a case of Alpha-type streptococci, which died on the eighth day, from systemic toxemia. The milk showed exfoliated cells, fibrin and leucocytes and when allowed to stand settled into two strata, one of which was pus. Sections from the kidneys, heart, liver and mammary lymph-glands showed an acute parenchymatous nephritis, cloudy swelling of the heart muscle and liver and hemorrhagic infiltration of the lymph-glands. Cultures from the blood and tissues named were negative, indicating that the fatal issue was due to a toxemia rather than bacteremia. The gross lesions of mastitis are so apparent and so well known that it would be a waste of time to describe them here.

SYMPTOMS

The clinical manifestations of mastitis vary, depending upon the extent, cause, resistance of the host or virulence of the invading organism. In mild cases, where the involvement is limited, the invading organism of low virulence and the animal resistance high, the clinical manifestations may be limited to a low-grade inflammation, with the associated changes in the constituents of the secretion. This picture changes as the other extreme is approached, to one of an intense inflammatory reaction, with the secretion greatly lessened and containing large amounts of pathological exudates and tissue debris, together with extreme systemic symptoms due to absorption of toxic material or even the infectious agent itself. Either one or all of the quarters may be involved. However, when more than one quarter is involved it is my opinion that the infectious material gained entrance through the teat canal, rather than affecting the adjacent quarter by continuity. In other words, unless the process is extremely malignant and the adjacent connective tissue saturated with the infecting organisms, I do not believe that one quarter is affected from another. This belief has recently been strengthened by the work of Dr. Theobald Smith, working with *Bacillus abortus*. His work indicates that when *B. abortus* was injected into a quarter the production of agglutinins was limited to that quarter.

TREATMENT

While this paper has to do primarily with a brief discussion of the cause of mastitis and the basic lesions thereof, it would not be fitting to close this paper without a brief discussion of prophylaxis and treatment, for the reason that although the etiological factors and anatomic lesions are of importance to the practitioner, it is really the prevention and cure that he is primarily interested in, and a brief discussion of the procedures for prevention and cure will perhaps serve as a stimulus for a general discussion of this phase of the subject.

Prevention of mastitis is the ideal to be sought for. Perhaps the most potent factor in the prevention of infectious mastitis is, as in other infectious diseases, sanitation. Scrupulous cleanliness should be practiced. The environment should be kept clean and each animal at the time of milking should be thoroughly washed. That is, the udder and adjoining parts should be thoroughly cleansed. Milkers should be subjected to a physical examination each month and any one showing evidence of an infectious process should not be allowed to come in contact with the cows. Each milker should be compelled to dress himself in a white suit, washed and sterilized at least every two days. He should further be compelled to wash his hands carefully before milking and after every cow, while any cow showing signs of infection should be isolated from the remainder of the herd and milked by some one who does not need to come in contact with the main herd, or at least such infected cows should be milked last and their milk rejected.

The treatment of mastitis is at best difficult. Therefore no routine treatment has ever held in vogue for any length of time. The administration of formalin has been praised by some. My experience with it has not made of me a very enthusiastic supporter of it. Neither has ether vapor. I positively condemn the practice of injecting antiseptic or germicidal agents into the affected quarter unless it has been surgically drained. To do so is, in my opinion, little short of malpractice. Internal medication is limited to eliminative and supportive treatment. I do not believe that any of the so-called specifics are of great value in overcoming an infectious process in the gland.

Massage of the affected parts, while having been practiced for many years, can not be said to be a rational treatment. One would not massage a boil for the reason that such would tend to

spread the infectious material to adjoining uninfected tissue. The application of cold or heat is splendid if it can be kept up. I have found that the use of bacterins and intravenous administration of acriflavine have been quite satisfactory in my hands and I believe that such treatment, together with proper diet, rest and eliminative and supportive medication, offers the most rational treatment. It is of course understood that withdrawal of the exudate-laden secretion should be practiced, most desirably with a sterile milk-catheter. In such cases as it is indicated, surgical drainage and even ablation of the gland should be practiced.

CHRONIC MASTITIS

Regarding the condition commonly known as chronic mastitis, I believe that this condition is due to an infection obtaining entrance through an abrasion and is limited primarily to the external interstitial tissue, or it may be a retained focal infection following an acute parenchymatous process. Regardless of what its mode of origin is, it is essentially an interstitial involvement, presenting an occasional intermittent attack upon a limited portion of the parenchymatous tissue. Sections of such cases support this view-point, inasmuch as the lesion seen is virtually a slow fibrosis, accompanied with a low-grade inflammation. In such cases bacterination proves very efficient, although phlegmonous conditions occasionally occur in spite of such treatment and necessitate surgical intervention.

After all has been said and done, it will be found that individual resistance upon the part of the host plays a most important part. That is evident when one observes recoveries from mastitis after the most charlatanous treatment bordering upon abuse. I have one case, in my system of case records, where, after draining a quarter, I returned on the third day to see the patient and found the entire udder encased in a sack containing bread and milk. When asked to explain this treatment the owner replied that such treatment had been prescribed for him at one time when he suffered from boils and he supposed that it would be equally as efficacious for mastitis. That either he or the cow recovered can be attributed more to a splendid resistance than to the treatment, which was nothing more than a perfect microbial feeding-ground.

I might add here that the meddlesome owner who insists upon using a teat-tube, which he has lubricated with saliva, to relieve such conditions coming under the common vernacular of "hard

milking," and the owner who insists upon adding to the treatment prescribed by his veterinarian, is the primary predisposing factor in many cases of infectious mastitis and the fatal issue of many cases which should recover. As a matter of fact I believe ignorance or shiftlessness on the part of certain owners serves to swell the number of cases coming under observation. It is a very common thing to have an owner tell you, when relating the history of a case of mastitis, that the first trouble was "hard milking" and that he tried to relieve this with an old teat-tube lying in the stable window, or with a piece of straw, a nail or a feather.

COLORS IN DOGS

Colored Maltese inhabit the Island of Malta but only the white variety is seen in England.

A Pomeranian usually changes a little in color, with the change of the puppy coat, between the ages of seven and ten months.

The chief difference between the Esquimaux and the elkhound is that the former is smaller, with white predominating, while the elkhound is mostly grey-sable.

Black tongues, a distinctive mark of the chow, and black noses, which belong to the Pekingese, are sometimes absent in early puppyhood, which is a source of worry to the uninitiated. Generally the black will develop as the dog grows older.

Many Yorkshire terriers are being shown with mahogany tan and very dark back, which is altogether wrong, according to Robert Green, Yorkshire expert of England. The tan should be the sovereign color and in three shades, lightest on head, darkening toward the ear-roots and deeper on the muzzle and feet, toning lighter toward the body. The body color should be blue, not black.

TO REPRESENT VETERINARIANS

At a recent meeting of the Pennsylvania State Veterinary Medical Association, three of its members, Drs. W. A. Haines, Louis A. Klein and Thomas D. James, were delegated to represent said Association in the Pennsylvania State Council of Allied Agricultural Associations, Dr. W. A. Haines being made Director. These appointments were the results of the personal invitation made by the President of the Allied Agricultural Associations before a meeting of the Pennsylvania State Veterinary Medical Association.

UMBILICAL HERNIA IN THE PIG¹

By W. F. GUARD, Ames, Ia.

At the 1920 meeting of the Iowa Veterinary Association, I made a progress report upon the subject of operative treatment for umbilical hernia in the pig and since pursuing that subject further, we have developed a technique which seems far superior to any of our previous methods. Therefore, without going into detailed discussion of the subject of umbilical hernia, I wish to present the technique which we now employ and some of our conclusions.

PREPARATION

In the first place we consider it quite an advantage to operate pigs as early in life as possible, before the ring has enlarged to any extent, and thereby caused any additional atrophy and weakening of the abdominal wall surrounding the ring. If this atrophy and weakening is present, we consider it almost necessarily an incurable case. We have successfully operated upon many pigs weighing from 80 to 150 pounds which had well-defined hernial rings and no tendency towards weakening of the abdominal wall surrounding the ring. However, we prefer pigs weighing fifty pounds or under. The pigs should be starved for at least twenty-four hours before the operation. In discussion the operation it is necessary to describe the technique for both the gilt and male pig, since we have a variation in the anatomical relations.

OPERATION

First, the gilt. The operative field having been thoroughly prepared for operation is anesthetized by injecting a local anesthetic into the skin around the intended lines of incision. An *elliptical* incision is now made through the skin, including as much of the skin as we care to remove with the hernial sac. This eliminates all unnecessary dissection in isolating the sac and also includes any abrasions or abscesses that may be present at the lowest portion of the sac and which can be removed with the sac without contaminating the operative field.

The subcutaneous tissue is now broken down by blunt dissection so that the peritoneal hernial sac is isolated down to the hernial ring. The subcutaneous areolar connective tissue is now dissected away from the margin of the ring for about one inch, so

¹Received for publication, August 21, 1923.

that the outer sheath of the rectus abdominus muscle (formed by the fusion of the aponeuroses of the external and internal oblique muscles) is clearly visible around the hernial ring. The hernial sac is now opened in order to free the sac completely of all contents. Occasionally one finds strips of omentum adherent to the sac in and about the ring. The hernial ring is now anesthetized by injecting a $\frac{1}{2}\%$ solution of a local anesthetic around the base of the ring between the peritoneum and the abdominal floor so that the peritoneum, which is the sensitive structure in this region, will be completely anesthetized. This injection is accomplished by placing the finger in the peritoneal cavity to direct the needle and prevent it from penetrating the peritoneum. It is very important to have this area anesthetized in order to prevent struggling which would force the abdominal content into the sac through the ring as one is attempting to place the sutures.

In male pigs this preliminary technique is slightly different, due to the fact that the prepuce and preputial sac are closely adherent to the peritoneal hernial sac (figure 1). Consequently, these structures must be carefully separated and the sheath and preputial sac removed from the field of operation before one can conveniently proceed further.

We first make a U-shaped incision through the skin, with the two ends of the incision lying on either side of the prepuce and extending an inch or more posterior to the preputial opening (figure 2). This permits us to isolate carefully the prepuce and preputial sac which can then be reflected, as shown in figure 3. A second incision, uniting the two ends of the U-shaped incision of figure 2, is now made so as to include a crescent-shaped island of the skin, which represents the excess skin to be removed with the hernial sac, which is also shown in figure 3. With this explanation of the difference in the procedures of isolating the sac in the two sexes we are now ready to obliterate the hernial ring. Figure 4 shows two mattress stitches (cat gut no. 4) being drawn into position and illustrates our method of obliterating the hernial ring. We prefer the mattress stitch, since it is an interrupted type of suture, which holds the peritoneal surfaces in close apposition and does not completely ligate the hernial sac. (We believe that the complete ligation of the sac, as in the application of the shoemaker's stitch, does not give favorable results in these cases where it is necessary to cover the line of suture.)

After completely obliterating the hernial ring by the required

number of mattress stitches, the hernial sac is then removed close to the line of sutures. The next step consists in uniting the right and left muscle sheaths or fascia, referred to previously in such a manner as to bury completely the stump of the hernial sac. This is accomplished by using the continuous cat gut suture no. 3 or 4, beginning at one end and drawing the ventral surfaces of the right and left sheaths into apposition, exactly as you apply the Lembert stitch in closing the uterus following cesarean section. Figure 5 shows the stitches in position, while figure 6 illustrates the completion of the stitch so that the sheaths of the opposite sides are in direct apposition and the stump of the hernial sac completely covered. This tends to give additional support, relieves the strain and tension upon the deeper sutures without weakening the wall at any point. We now suture the skin with a continuous cat-gut suture as shown in figure 7. Our next step is to cover completely the line of suture with collodion and cotton as in figure 8. This serves the double purpose of protecting the field operation from contamination and also gives additional surface support.

After the dressing has thoroughly dried, the animal is placed in close confinement in a small, clean stall which can be kept clean and dry. Dog kennels with slat bottoms are ideal. The pig should be kept thus confined for at least a week and during this time the diet should be light and laxative. We have tried several other methods of operating and in all others had frequent recurrences. Using the method just described, our results have been very satisfactory in all cases where there is a definite abdominal ring.

SUMMARY OF IMPORTANT POINTS

1. The hernial ring must be definite.
2. Dieting the animal before and after its operation, together with close confinement.
3. Asepsis.
4. Careful application of the technique as described.

ACKNOWLEDGMENTS

The author wishes to acknowledge the cooperation and valuable suggestions of Doctor H. E. Bemis in developing the above technic; also the aid of Dr. H. S. Murphey on the anatomy of the region. The photographs for the pictures used in this article were made by Mr. E. H. Richardson, College Photographer.



Fig. 1. Umbilical hernia in the male pig.

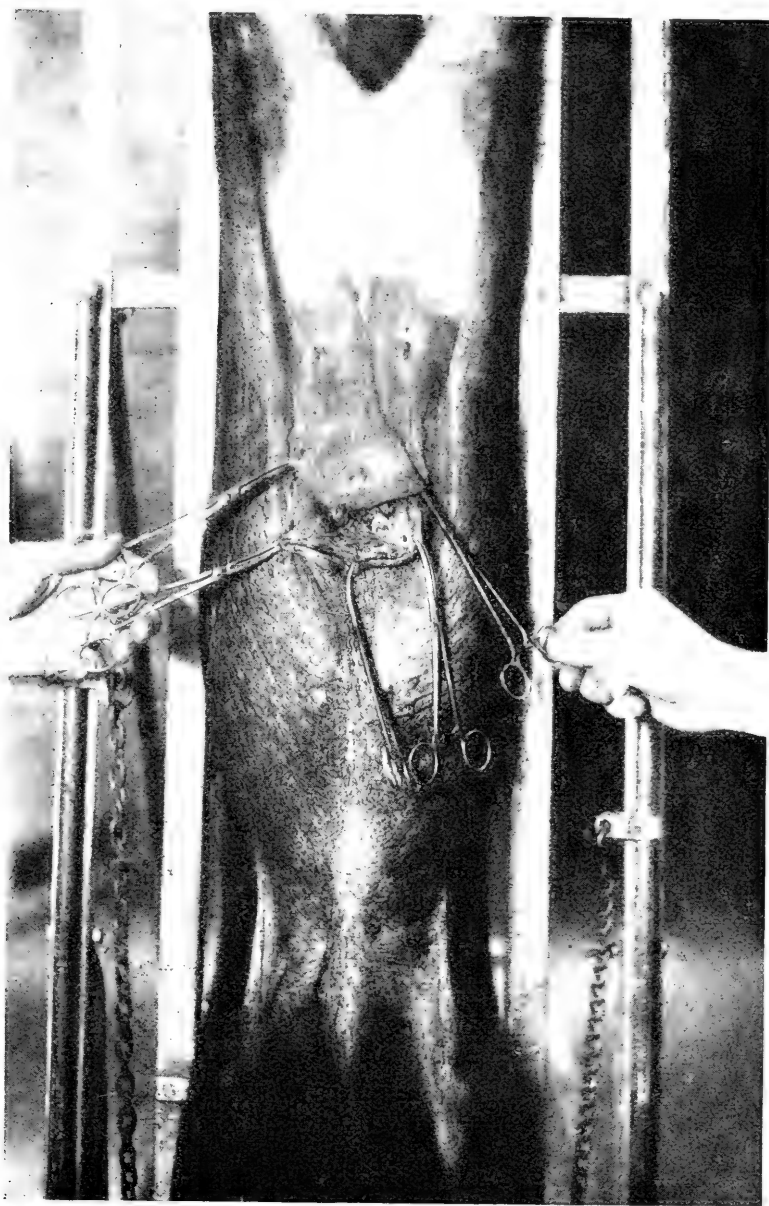


Fig. 2. U-shaped incision isolating the penis and prepuce.

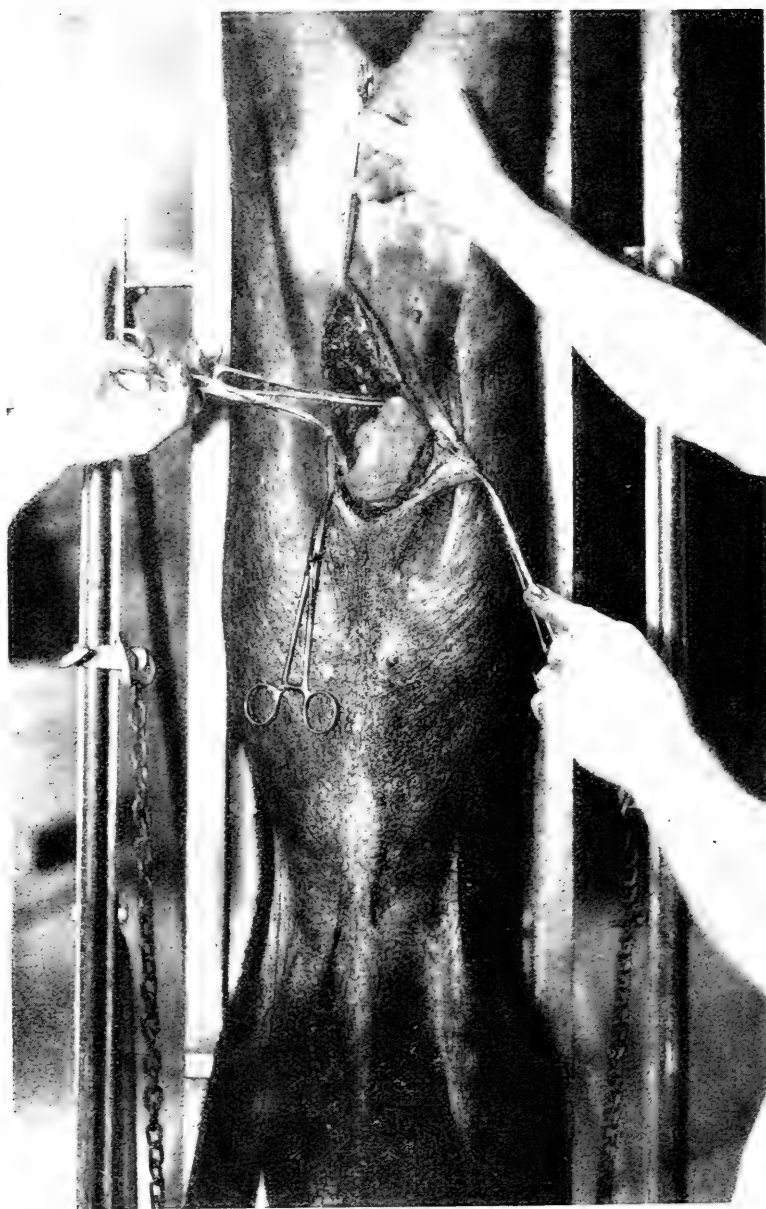


Fig. 3. Prepuce reflected. Peritoneal sac covered by island of excess skin.



Fig. 4. Mattress sutures being placed in peritoneal sac.

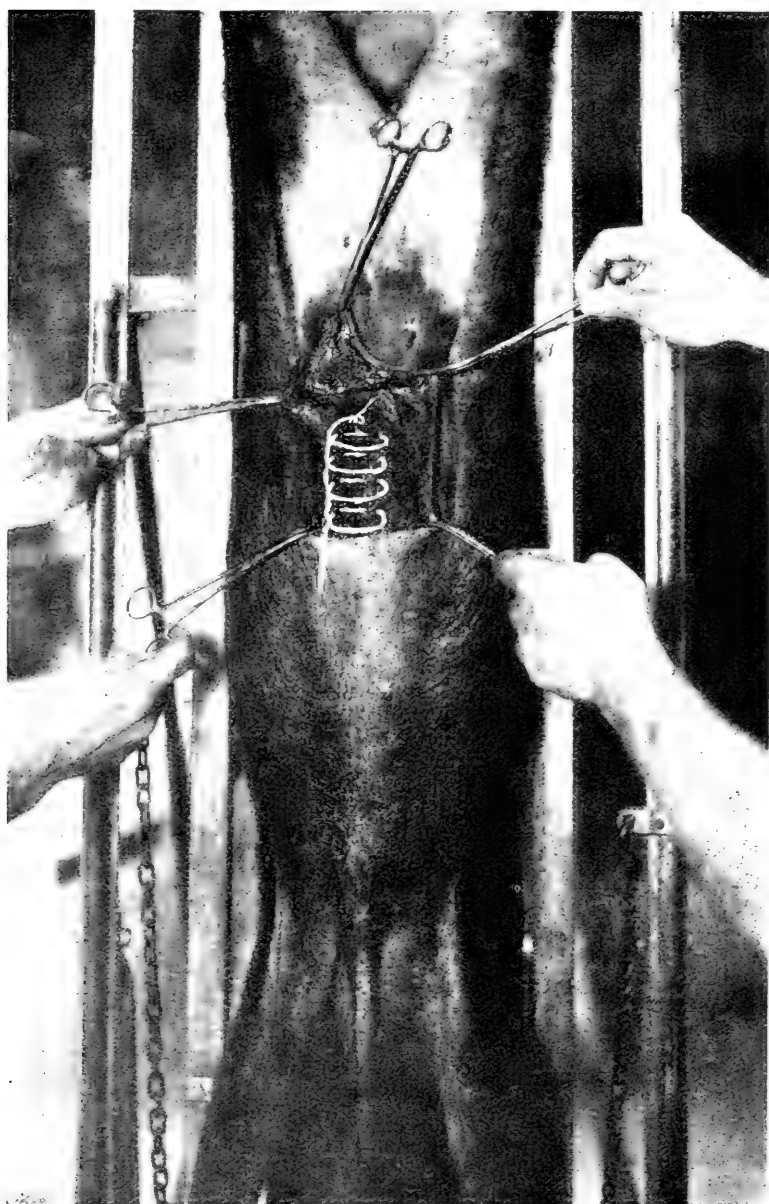


Fig. 5. Showing continuous suture placed in the fascia well back on either side and carried over the first line of suture in the sac.

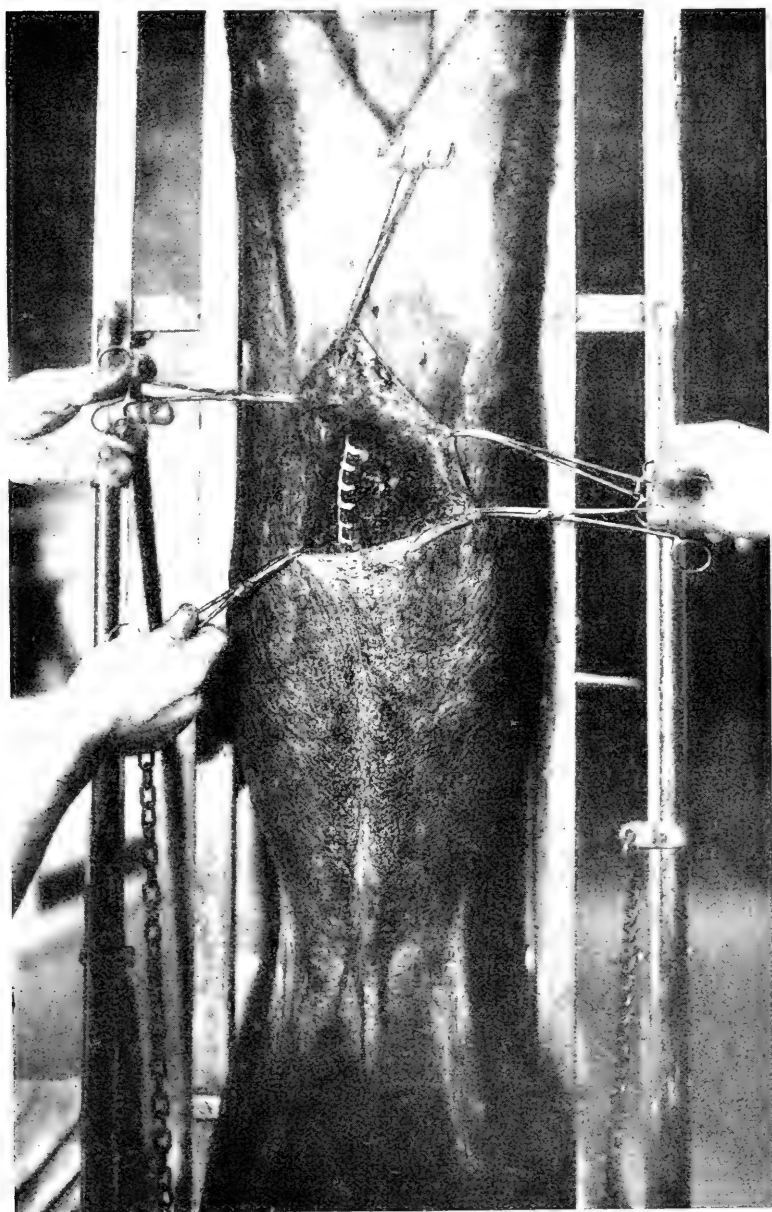


Fig. 6. Showing second line of suture tightened and tied.



Fig. 7. Showing continuous suture in the skin.



Fig. 8. Showing final dressing of the wound.

MOLDS IN SILAGE AND THEIR SIGNIFICANCE IN THE PRODUCTION OF DISEASE AMONG LIVE STOCK¹

By C. H. ECKLES, C. P. FITCH, and J. L. SEAL

University of Minnesota, University Farm, St. Paul, Minnesota²

The use of corn silage as part of the ration for live stock has become a common practice in recent years. The rapid extension of the use of silage and the lack of experience on the part of many of the users have resulted in numerous inquiries regarding all phases of the preparation and use of this roughage.

One of the most common of these questions asked the Experiment Stations concerns the possible danger from feeding silage containing mold. The conditions responsible for the development of molds in the silo are reasonably well understood, and the presence of any considerable quantity indicates proper methods were not followed in filling the silo.

Concerning the possible danger of molds and forage poisoning from feeding moldy silage, little positive evidence has been available. It is not unusual, however, for the owners of live stock and, at times, veterinarians who are called in a professional capacity, to attribute sickness of live stock of an obscure nature to poisoning from silage. As a rule, the possible danger of mold in the silage is emphasized in this connection. Among those who have reported outbreaks of this character are Stange (1911), Beaumont (1909), Pearson (1900), and Rusk and Grindley (1918). Although the evidence is conclusive that in some of these cases the silage was the cause of the sickness, in no case reported is there definite evidence presented indicating a causal relation of mold in the silage. Stange apparently established the relationship of the silage to the death of horses by feeding two animals with suspected silage. Both died within a few days. Rusk and Grindley investigated three cases where sickness in cattle or horses was attributed to silage.

In two of these outbreaks cattle had died, and others showed abnormal conditions. It was not found possible in either case to cause death by feeding the suspected silage to cattle. In the outbreak where horses were affected, it was proved conclusively by feeding tests that the silage would cause the death of horses within a few days when fed in moderate amounts. It was concluded by Graham, who continued the investigation, that it was a case of botulism. In none of these cases where

¹Published with the approval of the Director as Paper 417, Journal Series, Minnesota Agricultural Experiment Station. Received for publication, November 6, 1923.

²C. H. Eckles, Chief, Division of Dairy Husbandry. C. P. Fitch, Chief, Division of Veterinary Medicine. J. L. Seal, Assistant Plant Pathologist.

positive results were obtained by feeding experiments with the suspected silage, was there any special reason for suspecting the molds to be the active factor.

Church and Buckley have recently carried on a rather extensive investigation of the toxicity of molds for laboratory animals. As a result of their experiments they conclude that (1) "While pure cultures of common, saprophytic molds are not generally toxic when fed to laboratory animals, the presence of mold in forage or in human food is nevertheless an indication of incipient spoilage. (2) By the extensive feeding of laboratory animals, pure cultures of molds common in forage and food products, one, and often the obvious factor of forage and food spoilage, may probably be eliminated from charges of toxicity."

PATHOLOGICAL PROPERTIES OF MOLDS

In tables 2 and 3 are listed the molds isolated from the silage fed experimentally, also those found in samples of moldy silage from 19 silos in various parts of the state. So far as we are aware, the only molds in these samples which have ever been suspected of causing sickness in animals are those belonging to the *Aspergillus* group. Mayo (1891) believed *Aspergillus glaucus* to be the cause of enzootic cerebritis in horses in Kansas. This view was supported by Dalrymple (1893). Pammel says "This organism is not pathogenic, but probably develops a poisonous substance which may produce a disturbance." Although several references are found regarding the possible pathogenic effects of this species, the evidence is by no means conclusive, and other organisms, especially *Clostridium botulinum*, may have been the source of the trouble. *Aspergillus fumigatus* has also been credited with having pathogenic properties appearing in the lungs or bronchial tubes. Bodin and Gautier (1906) also report experiments showing this species has the ability to produce a toxin under suitable conditions, one of which is a neutral or alkaline medium. *Aspergillus niger* has been found in the lungs and in skin infections, but no symptoms are reported in any way resembling those of forage poisoning.

FEEDING EXPERIMENTS

The effect of moldy silage was tested experimentally by us by means of feeding experiments conducted with three cattle, one horse, and two sheep. Beginning in December, 1920, three cattle, a nine-months-old bull, a nine-months-old heifer, and a four-year-old cow, were placed on a ration of moldy silage,

hay, and grain. A statement of the weights and average ration fed is given in table I. This feeding test continued 128 days.

TABLE I—AGE, WEIGHT AND AVERAGE DAILY FEED CONSUMED FOR 128 DAYS

	Guernsey Bull	Holstein Heifer	Grade Shorthorn Cow
Age.....	9 months	9 months	4 years
Weight at beginning, pounds.....	440	560	1068
Weight at close, pounds.....	478	550	1027
Hay per day, pounds.....	2	2	3.3
Grain per day, pounds.....	2.3	2.3	5.6
Moldy silage per day, pounds.....	11.7	12.4	16.1

After the first few days, no difficulty was experienced in getting the animals to eat the ration, in fact the moldy silage was eaten as readily as silage free from mold. The moldy silage used was mostly from silos on the University grounds. Some of the material used contained immense quantities of actively growing molds, developed by inoculating silage with silage molds and allowing several days for development. Small lots of moldy silage received at intervals from various parts of the state were also included. Among these lots from the outside were some suspected of causing sickness in live stock.

Composite samples of the moldy silage fed were made by placing a small portion from that fed each day in a closed container. At the end of from 7 to 10 days the composite sample was mixed and delivered to the Division of Plant Pathology for the purpose of determining the mold flora. The results of these determinations are given in table II. The results of the feeding tests were entirely negative. The three animals remained in perfectly good health during the entire period.

During the winter of 1921-22 a horse and two sheep were fed moldy silage over a period of three and a half months. The

TABLE II—THE FLORA OF SILAGE USED IN FEEDING TESTS

Sample Number	<i>Penicillium glaucum</i>	<i>Penicillium expansum</i>	<i>Aspergillus glaucus</i>	<i>Aspergillus fumigatus</i>	<i>Aspergillus flavus</i>	<i>Aspergillus niger</i>	<i>Rhizopus nigricans</i>	<i>Fusarium</i> sp.	<i>Saccharomyces</i> sp.	<i>Monascus purpureus</i>	<i>Mucor</i> sp.	<i>Phycomyces</i> (unidentified)
20		†	†		††	†	†	†				†
21		†			†		†	††				
22		†		††						†		
23	††				†							
24		†				†	††	†	†		†	
25		††			††	†	†	†			†	
26			†		†		††	†				
27	†			†		†		††				
28		††			†		†			†		
29	†	†				†		††				†
30	††		††		†		†		†		†	
31		††			††			†				
32	†				††		†	†				
33		†	†	†		†		††				†
34		†			††			†				
35												
Total	5	10	4	3	9	7	8	11	2	2	3	3

sheep were ewes, each two years old. The horse was approximately 18 years old and in fair condition. With both the horse and the sheep we had difficulty at first in getting the animals to eat the moldy material. Grain was sprinkled over the silage and all other feed removed, before the animals would eat it. Small quantities were fed in the beginning and gradually increased until 10 pounds of moldy silage was consumed daily by the horse and 2.5 pounds daily by each sheep. No injurious effects of any kind could be detected.

In May, 1922, we were asked to make an investigation on a farm near Mora, Minnesota, where the owner had lost five cattle, and the local veterinarian had attributed the trouble to the silage. No sick animals were on hand at the time, removing the possibility of post-mortem examination. The silage suspected of causing the trouble contained no more mold than typical, average silage. It appeared normal in every way. Half a ton was shipped to the Experiment Station and used in a feeding experiment. Two mature cows received from 10 to 60 pounds daily for 13 days, and two others small quantities for a few days only. One cow consumed a total of 427 pounds. No ill effects were noted with any of the four animals used.

FEEDING EXPERIMENTS WITH PURE CULTURE

It was realized that the moldy silage, as fed, supplied an immense number of spores and the products resulting from the action of the mold on the forage. However, except in that portion of the silage in which mold was developed intentionally, the amount of actively growing mold mycelia was probably small. It was thought desirable to test further the effect of active cultures of the several species isolated upon the experiment animals.

Cultures were prepared as listed in table IV. These cultures were grown at room temperature on Czapek's solution (liquid). Five cultures, 200 cc each, were prepared of each culture. In from five to seven days a heavy growth had developed on the surface. The cultures were then given on April 21, April 25, May 10, May 17, and June 20, by means of syringe, to the three experiment cattle which had been already fed on moldy silage for 128 days. A careful examination of the animals was made daily during and following the feeding period. Nothing was noted in any way abnormal in respect to the animals' condition. The normal amount of feed and water was con-

sumed, and no evidence was observed of any effect upon the heart or the circulation.

The two younger animals were killed and carefully autopsied July 25, 1921, about a month after the last dose of mold, and no evidence of disease could be found. The older animal was killed and autopsied March 2, 1923. No evidence of the molds could be noted.

In the spring of 1922 similar tests were made with the horse and the two sheep, which had received moldy silage for three and a half months. At this time cultures of all species listed in table IV were used. On April 29, 1500 cc of mixed cultures were given the horse and 250 cc to each of the sheep. The horse was drenched by the use of a bottle and some of the liquid lost. The sheep were given the culture by means of a syringe, after the surface growth had been broken up by grinding with sterile water in a mortar. May 5, 1500 cc of mixed cultures were again given the horse, this time with a stomach-tube, so none of the liquid was lost. The sheep were each given 250 cc of the same mixture by means of a syringe.

May 22, 2,000 cc of mixed cultures were given the horse, and 250 cc to each of the sheep. Careful daily observations during the intervals between doses and following, failed to show any ill effect from the mold cultures.

The horse is still in use and in the best of health. One of the sheep is still living and in good condition; the other, four weeks after the last drenching, developed acute parturient paralysis and died after four days. Careful autopsy and bacteriological study failed to show any evidence of molds as a cause of death. This form of paralysis is not uncommon among sheep in Minnesota.

THE FLORA OF SILAGE

Table II gives the result of the study made of the flora of the moldy silage used in the feeding tests. It will be noted that most of the molds present were common species known to be harmless. Those of the *Aspergillus* group are the only species isolated which have been reported to be the cause of sickness in animals, and, as previously indicated, the evidence is by no means conclusive regarding danger from these species.

While the experimental feeding tests were in progress, a study was made of the flora of silage in 19 lots of silage which were not used in the feeding trials and which were obtained from different parts of Minnesota. The results of this study are given in table III. With the exception of nos. 2 and 17, these samples

TABLE III—MOLDS ISOLATED FROM SAMPLES OF MOLDY SILAGE FROM NINETEEN SILOS

Sample Number	<i>Penicillium glaucum</i>	<i>Penicillium expansion</i>	<i>Aspergillus glaucus</i>	<i>Aspergillus fumigatus</i>	<i>Aspergillus flavus</i>	<i>Aspergillus niger</i>	<i>Rhizopus nigricans</i>	<i>Fusarium sp.</i>	<i>Saccharomyces sp.</i>	<i>Monascus purpureus</i>	<i>Mucor sp.</i>	<i>Phycomyete</i> (unidentified)
1	††a					†b		†			†	
2	†	†			†	†	†	†	†			
3		††				†						
4		†				††		†				
5		†	†	†	†	†	††	†			†	
6		††						†				
7	†		†	†	†	†	††			†		
8		†						††				
9		†	†		††	††		†			†	
10				††	†	†						†
11		†	††						††			
12	††	††	†	†	†		††					
13								†				
14	†				†	††	†					
15					††					†	†	
16	†	†		†			†	††		†	†	††
17					††			††				
18		†	†			†		††				
19				†	†		†					
Total	7	11	6	5	9	9	6	11	2	3	5	2

a††=predominating species in the samples.

b†=present in samples.

represented silos where mold had developed to a point that the owners were concerned as to the possible danger of using it as feed. Some of the samples were secured from county agents in response to a request for such samples; the others were from the owners direct. Sample 17 was from silage fed on a farm where the death of five cattle had been attributed to the silage. However, mold was not in evidence in this sample. Sample 2 represents silage suspected of having caused the death of sixteen cattle. This silage also appeared perfectly normal, and contained no visible mold.

Table IV gives a summary of the species isolated, and the number of samples in which they were found. This table shows common molds made up the greater part of the flora, and that the species isolated were the same as those from the silage used

TABLE IV—FUNGI ISOLATED FROM MOLDY SILAGE

Serial Number	Fungus	No. of samples from which isolated	
		Silage fed experimentally 16 samples	Survey of moldy silage flora. 19 silos
1	<i>Penicillium glaucum</i>	5	7
2	<i>Penicillium expansion</i>	10	11
3	<i>Aspergillus glaucus</i>	4	6
4	<i>Aspergillus fumigatus</i>	3	5
5	<i>Aspergillus flavus</i>	9	9
6	<i>Aspergillus niger</i>	7	9
7	<i>Rhizopus nigricans</i>	8	6
8	<i>Fusarium sp.</i>	11	11
9	<i>Saccharomyces sp.</i>	2	2
10	<i>Monascus purpureus</i>	2	3
11	<i>Mucor sp.</i>	3	5
12	<i>Phycomyete</i> (unidentified).....	3	2

in the feeding tests. This result leads us to conclude that the moldy silage fed was typical of that usually encountered. Most of the samples were so heavily infected with one or two species that frequently it was difficult to isolate other than the predominant forms. Undoubtedly there were molds in some individual samples which were not isolated.

DISCUSSION OF RESULTS

As indicated, there is some evidence from the investigations of others that certain of the molds found may be dangerous at times, but the results of our feeding tests do not indicate danger from this source. Furthermore, practical experience teaches that mold in silage is not generally harmful. Many silo owners can recall incidents when live stock have gained access to silage discarded on account of mold and have eaten it freely without any detrimental results. Mold in fact is found more or less in every silo. Even the best preserved silage will show some mold in spots near doors or the walls. The presence of small amounts of mold ordinarily attracts little attention, unless something unusual occurs, for example, sickness among the animals. We have noted that the reports of injury from feeding moldy silage usually come from those with little experience in its use. The tendency appears to be to ascribe any difficulty with live stock, the cause of which is not known, to the silage which is to them an unfamiliar feed. We do not maintain that silage may not be a source of danger to live stock, since the evidence is conclusive that in rare instances it may be the cause of serious sickness, especially to horses. Silage found to have such properties is not necessarily moldy, but may appear to be entirely normal. The investigations of Graham indicate that these cases are botulism rather than the results of mold growth. The presence of mold is no evidence of the presence of *C. botulinum* or its products.

We recommend, as a practical procedure, the discarding of badly molded silage, but the feeder need not hesitate to utilize silage which contains some mold, especially when fed to cattle.

REFERENCES

- Beaumont, L. C.: (1909). Mo. Valley Vet. Bul. 4, pp. 30-32.
Bodin and Gautier: (1906). Ann. Inst. Pasteur, 20 (3), pp. 209-224.
Church, M. B., and Buckley, J. S.: (1923). North Am. Vet., 4 (1), pp. 7-12.
Dalrymple, W. H.: (1893). Louisiana Agr. Exp. Sta. Bul. 22.
Graham, Brueckner, and Pontius: (1917). Kentucky Agr. Exp. Sta. Bulletins 207 and 208.
Graham, Robert: (1920). College of Agr., University of Illinois, Extension Cir. 38.
Mayo, N. S.: (1891). Kansas Agr. Exp. Station Bul. 24.
Pammel, L. H.: Manual of Poisonous Plants, p. 257.
Pearson, L.: (1900-1) Jour. Comp. Med. and Vet. Arch., XXI, p. 109; XXII, p. 446.
Rusk and Grindley: (1918). Ill. Agr. Exp. Sta. Bul. 210.
Stange, C. H.: (1911). Amer. Vet. Rev. 28 (4), pp. 473-488.

CLOSTRIDIUM BOTULINUM TYPE C ASSOCIATED WITH A LIMBERNECK-LIKE DISEASE IN CHICKENS AND DUCKS¹

By ROBERT GRAHAM and I. B. BOUGHTON

University of Illinois, Urbana, Ill.

Since Dickens (1918) noted the causative relation of one type of "limberneck" in chickens to the ingestion of canned vegetables containing botulinus toxin, certain chickens showing similar clinical symptoms received at the Laboratory of Animal Pathology and Hygiene have been examined for the presence of the botulinus organism or other related toxin-producing anaerobes. Two outbreaks of avian botulism type A have been encountered in Illinois, independent of the disease in the human family. In one outbreak (1921) garbage was fed, while in the other the poisonous feed could not be established. The type B botulinus organism was isolated (1923) from one of three chickens in a flock showing limberneck-like symptoms, although the primary relation of the type B botulinus poisoning to spontaneous outbreaks of avian botulism, or so-called limberneck, has not been shown in losses coming to our attention. In fact, illness in healthy chickens could not be induced by feeding this as well as other type B strains.

In five outbreaks of a disease affecting poultry which were characterized by lameness, leg, wing and neck weakness, diarrhea and drowsiness, the presence of a toxin-producing, anaerobic, rod-shaped, microorganism indistinguishable from *Clostridium botulinum* type C, isolated by Bengtson, of the Hygienic Laboratory, Washington, D. C., from the green fly larvae, was demonstrated in the intestinal contents or internal organs of one or more of the sick birds. The specific poison in one instance was demonstrated in the gastric intestinal contents. Pure cultures of this anaerobe were isolated from affected chickens in three of the outbreaks, though the suspected feed, other than fly larvae, found in the crop contents of one affected chicken, was not definitely incriminated.

LOCATION OF OUTBREAKS SUGGEST WIDESPREAD DISTRIBUTION OF TYPE C

Naturally affected chickens (2770, 2771, 2772) were received from Drs. Brown and Hinkle, of Decatur, Macon County,

¹Abstract of Bulletin No. 246, Illinois Agricultural Experiment Station, October, 1923.

Illinois, July, 1921. Eight of the half-grown chickens in this flock died. Specimens (3419 and 3420) were received July 1, 1922, from Mr. John Thomen, Greenup, Cumberland County, Illinois. It was estimated several months later that sixty chickens of this flock died of the disease. The third group of affected chickens (3421, 3422, 3423) was received from Mr. A. E. Davidson, Mt. Sterling, Brown County, Illinois, on July 12, 1922. Twelve mature hens, fourteen half-grown pullets and one duck died in this flock. The fourth outbreak (3466, 3467, 3468) occurred on the farm of Mr. I. L. Durbin, Taylorville, Christian County, Illinois. Fifteen half-grown chickens in this flock died. The fifth outbreak (487) occurred at the University Poultry Farm, Champaign County, Illinois, and while not described in the bulletin, the clinical manifestations and the bacteriologic findings coincide with the aforementioned outbreaks.

CULTURAL CHARACTERS OF *C. BOTULINUM*, TYPE C

C. botulinum type C encountered in affected chickens is an anaerobic, gram-positive, non-motile, terminal-spore-forming, rod-shaped organism closely related to, if not identical with, the pathogenic anaerobe isolated by Bengtson from the larvae of the *Lucilia caesar* or greenbottle fly. Subcultures may fail to develop in glucose-agar and even in meat-mash media which is favorable for its development. Some subcultures showing characteristic growth in meat-mash media, and deep agar tubes, may not prove fatal to guinea pigs. The most consistent growth has been obtained in meat media, including lean beef, lean pork, beef liver, and pork liver. In addition to the cultural characters which distinguish type C strains from either A or B strains of the botulinus organism, the poison or toxin elaborated by it is not neutralized by botulinus antitoxins A or B. The symptoms induced in guinea pigs by the toxins of the A, B, and C organisms are similar however. The thermal death-point of type C spores is relatively lower than strains of type A. Fifteen minutes at 80° C. has rendered spore suspensions inert. The soluble toxin elaborated is destroyed in five minutes at 80° C.

SYMPTOMS OF TYPE C POISONING IN POULTRY

The mortality in naturally affected flocks has been variable. In two flocks it was negligible, while in another affected flock sixty chickens died. The symptoms in spontaneous and experimentally induced disease are marked by dullness, lameness, weakness and drowsiness. The eyes are closed, and weakness

of the neck and wing muscles becomes apparent as the disease progresses. In advanced cases the head and neck rest on the ground. Diarrhea is often present. About the yard and pen varying quantities of feathers have been noted in seriously affected flocks, while in handling affected chickens the feathers may be easily removed.

Milder forms of the disease are accompanied by inability to walk. Aside from leg weakness, some affected birds in one flock appeared healthy. Sick chickens in flocks, as well as specimens received for examination from two other flocks, failed to show the typical, limberneck syndrome. Spontaneous recovery was reported in affected chickens and observed in certain specimens held under observation at the laboratory.

SUSCEPTIBILITY OF CHICKENS

Healthy chickens under experimental conditions are somewhat resistant to the ingestion of type C toxin, though typical cases of the disease have been induced by feeding the cultures, as well as the culture filtrate elaborated by type C strains obtained from spontaneous cases of the disease. Chickens chronically affected with chickenpox have proved more susceptible than healthy chickens. Relatively large amounts (20 cc) of the culture fed at one time may induce a fatal form of the disease in healthy chickens, though larger amounts are often necessary. Three cubic centimeters of the culture fed daily for a period of ten consecutive days produced a fatal type of the disease in chickens. Similar amounts of the filtrate did not produce symptoms.

SUSCEPTIBILITY OF OTHER FARM ANIMALS

The ingestion by horses of 50 grams of the culture per thousand pounds live weight was sufficient to induce a transitory illness, while 100 grams per thousand pounds live weight terminated fatally. The culture when fed to cattle in amounts varying from 50 to 400 grams per thousand pounds live weight induced transitory symptoms of depression, stiffness, loss in weight, with incoordination of movement. Affected cattle fell to their knees when forced to move. The illness was followed by complete recovery in 3 to 5 weeks. Sheep and goats proved susceptible to the subcutaneous injection of 2 to 5 cc of the culture. Swine, including sows and shotes, proved resistant to the ingestion of massive amounts. Nursing pigs remained healthy while the dam ingested liberal amounts of the culture. In sheep, death

was induced by injecting subcutaneously 1 to 3 cc of the culture.

The illness induced in experiment horses and cattle, by feeding the culture, suggests that these animals are susceptible to type C poison.

LESIONS

In chickens that suffered from the spontaneous disease, as well as in chickens artificially infected, a catarrhal enteritis with occasional hemorrhages in the mucosa of the small intestine was found. The amount of toxin ingested is doubtless an important factor in the gross lesions as well as the mortality in the flock. Intestinal parasites were encountered in some naturally affected chickens. The increased susceptibility of chickens suffering from a chronic disease has suggested the possible part played by parasitism or other secondary agencies.

SOIL CONTAMINATION

Bacteriologic examination of soil samples obtained from several chicken yards on the premises where chickens became naturally affected gave positive evidence in two instances only. Sample of soil from a barnyard where horses died also gave positive results. Isolation of strains from soil has not been accomplished, but the presence of the toxin in the soil cultures was demonstrated by feeding impure, soil-culture filtrates to type-C-protected and to unprotected animals. The relation of type C in soil to the occurrence of the disease in poultry is probably secondary, since type C has been detected in soil on premises where chickens remained healthy.

ANTITOXIN

An antitoxin of low potency has been prepared from experiment animals (goats and calves) by injecting non-lethal amounts of the culture filtrate. The specificity of the antitoxin in healthy, experiment animals has been shown in the results of experimental tests, but its value in the prevention and treatment of type C poisoning of naturally affected chickens remains undetermined. Antitoxin prepared against the strain isolated from the larvae of *Lucilia caesar* at the Hygienic Laboratory provided a specific protection against the toxins of the strains encountered in four of the outbreaks in chickens described in Bulletin No. 246. A and B antitoxins, however, gave no protection. The three type C strains isolated from poultry were used in preparing an antitoxin. Each protected against the homologous and heterologous strains and the fly larvae strain of Bengtson, as well as

against toxic larvae submitted by Dr. E. W. Saunders, of St. Louis, Missouri.

PARABOTULINUS OF SEDDON RESEMBLES TYPE C

Through the kindness of Dr. J. W. Buxton, Research Council, London, England, a culture of parobotulinus of Seddon was obtained for comparative study. Cultural and pathogenic characters observed to date suggest that the parobotulinus strain is closely related to American type C strain. The type C antitoxin prepared from three different type C strains protects guinea pigs against lethal amounts of the parobotulinus culture of Seddon. A and B botulinus antitoxins fail to protect against the parobotulinus toxin.

HORSES AND FARM POWER

The United States Department of Agriculture has recently investigated the relative advantages of horse power and motor power for farm operations and reports numerous reasons for the continued use of good draft horses. Horse power is characterized by its versatility and adaptability to perform various farm operations. The horse is not limited either by the topography of the ground or a specialized ability to perform only a few farm tasks economically.

The horse is self-replacing, earns its keep, and increases in value up to the marketable age. Mares enough may be bred yearly to replace the mature stock which is marketed. The young horses raised under this plan continually increase in value and at the same time they are paying their way by doing the farm work.

Keeping horses also helps to conserve the fertility of the soil and provides an element of interest which helps to keep the youngsters on the farm. Then too, there is less direct cash outlay for horse power, as horses consume home-grown feed chiefly.

Motor power, however, has advantages under certain conditions and in many cases the two forms of power—horses and tractors—are both used.

SWINE FLU AND ITS COMPLICATIONS¹

By C. C. HASTINGS

Williamsville, Ill.

Swine flu is an acute, contagious pneumonia of swine. It was recognized as a separate and distinct disease by veterinary practitioners in Illinois in the fall of 1916. At that time it was called contagious pneumonia and looked upon as a condition of little importance. However, as we study it more, we find that swine flu itself is not only a serious menace to the hog-raising industry, but its complications are fast depleting our pure-bred herds and making inroads in the grade herds.

OCCURRENCE

Swine flu occurs most extensively in the large, hog-raising states of the Central West, more especially in the pure-bred herds that exhibit at the various state and county fairs. It is observed in swine that are from three months to one year old, but may occur in small pigs or even mature animals, its course being lighter in aged hogs.

Evidently, climatic conditions play only a small part in the occurrence of swine flu, it being as prevalent during the summer months as during the winter. It is met with more frequently during the fall, due, no doubt, to the shipment of breeding animals to and from the different exhibitions. Also, to the practice of many breeders to purchase breeding stock, more especially boars, from show herds that have been immediately previously or at the time on the show circuit. This practice should be discouraged.

Swine flu is to be looked upon as a highly contagious disease and treated as such. It is an almost daily occurrence in the fall of the year for veterinary practitioners to be requested to administer to herds bearing the history of previous exposure through the show circuit. Of course, many sporadic cases appear that have no history of exposure. The same can be said of all swine diseases, including cholera.

ETIOLOGY

To my knowledge the etiological factor of swine flu has not been determined, but from all appearances it evidently is a

¹Read before the McLean County Veterinary Association, at Bloomington, Ill., November 20, 1923.

specific infection. Such theories as drafts, overfeeding, exposure, shipment, etc., can be considered only as predisposing causes.

SYMPTOMS

The period of incubation is five to seven days. A slight dullness and tucked-up appearance is noticed. The animals cough, often a loud, coarse, dry cough that can be heard for some distance, being more pronounced when they first get up. A characteristic wavy thump is present. Food is refused. Temperatures of 105° to 106° and higher at times. The course of the disease is about five days. When it subsides, the animal apparently is no worse off from its experience except the loss of flesh. About 98 per cent of affected pigs recover; the other 2 per cent die from pneumonia.

Swine flu should not be confused with the benign, thumpy condition caused by shipment, overfeeding, exposure, etc., often seen following the first cool nights in September and October. This condition can be differentiated from swine flu by its benign character and short duration, usually two to three days.

CONTROL

Quarantine and isolation. Separate sick from healthy hogs. All animals purchased, as well as those coming off the show circuit, should be held in quarantine fourteen days before being placed with the herd. It has been found that fourteen days after recovery they will not spread the disease. There have been cases where an animal turned into the herd ten days after recovery spread swine flu to the rest of the herd.

COMPLICATIONS

The complications of swine flu are many and varied. They include abortion, pig scours and chronic pneumonia.

Abortion: It has been estimated that on the average 25 per cent of gilts that apparently recover from flu abort at some time during their first pregnancy following. A large percentage that carry their litters up to time, farrow pigs that are known as "squealers." Such pigs have fine, silky hair, are weak, and have a premature appearance. They squeal, wander around the sow, and are not inclined to suck. Many of them die within forty-eight hours.

Scours: Those that survive the first few days usually scour. The feces are thin, at first brown in color, later becoming light.

Pig scours of this character is seldom if ever controlled. Dieting the sow is of some value.

Chronic pneumonia: For want of a better term, chronic pneumonia is used to designate a cold, chronic progressive pneumonia that is the most serious complication of swine flu. It is seen in pigs farrowed by sows that have apparently recovered from an attack of flu before they were bred.

The pigs that survive abortion and scours look almost normal the first month. Then several "bad doers" are noticed. At two months of age it is a "bad doing" herd. Thumps are often observed, eyes bright, appetite good, temperature normal, emaciation and anemia marked. Clinically they resemble wormy pigs. Autopsy reveals chronic, solidified areas in the lungs, on cut surface resembling liver with fibrous tissue intermixed, the alveoli being entirely obliterated. To the touch they are firm. It is a question if the lesions are the result of a previous inflammation or are of a progressive nature.

In view of the fact that in these herds hogs die constantly from one month to one year of age, it would resemble more of a progressive pneumonia. When vaccinating swine against cholera, it is imperative that this condition be not overlooked, for at no time during the life of hogs affected with chronic pneumonia is it safe to give them hog cholera virus. Chronic pneumonia is directly responsible for many of the serum breaks. If it is necessary to vaccinate such a herd, the owner should always be warned that trouble may be expected. It is a recognized fact that more post-vaccination trouble is met with in pure-bred than grade herds. Also more chronic pneumonia is seen in pure-bred herds.

CASE REPORT

This case report is recited here because it is typical of the condition seen in the field.

In October, 1921, eighty pure-bred Duroc-Jersey gilts, eight months old, and five young boars were purchased. The gilts and boars came from two separate farms, but were shipped in the same car a distance of sixty miles. Six days after arrival, the gilts were noticed to be sick, and a diagnosis of swine flu was made. The original owner of the gilts denied any presence of the disease on his farm. The original owner of the boars admitted that they had been exhibited at the State Fair (Spring-

field, Ill.) and had recovered from the flu but a few days previous to the sale. Evidently they were still spreading the infection.

The gilts apparently recovered, and were bred in November. The following February six aborted. In March they farrowed, and no accurate record was kept of the number of pigs born alive. It was estimated that 460 pigs were farrowed, eighty or ninety being dead. Some were born with scours, and every litter was affected more or less with scours, in spite of the fact the sows were fed nothing but oats for six days following farrowing. Several died when about twenty-four hours old. At eight weeks of age there remained 276 pigs, many of which were runty. They were vaccinated, and some trouble followed, as was expected. At ten months the herd consisted of 167 pigs, an average of a fraction over two pigs per sow. At that time they were sold, and weighed 136 pounds each. During their entire life they had access to blue-grass pasture and a self-feeder containing shelled corn and tannage.

On the same farm, farrowed in the same farrowing house, 500 pigs were raised from 97 aged sows. No trouble was seen in the pigs from the old sows, and when seven months old they were marketed, weighing over 200 pounds.

What remained of the eighty head of gilts were again bred in November, 1922, and the same chronic pneumonia appeared in their 1923 litters. However, not so much trouble was experienced, which goes to show that this disease is often, if not always, inherited and to a certain extent self-eliminated.

Note: The case report refers to gilts bought of Mr. L. J., a prominent farmer and hog-raiser living about six miles southwest of Bloomington. I do not know whether his farm is included in the McLean County system of farm sanitation but believe it is. I think Mr. J. tells the truth when he states that the gilts had not gone through disease while on his farm.

The young boars were from Mr. F. K., who lives just outside the northeast city limits of Bloomington. He has had all kinds of trouble on his farm to my knowledge, for I have been called in consultation to observe his herd at least twice and have found a sort of "Duke's mixture" each time. On one occasion, at least, my findings were verified by laboratory findings by Dr. Shore. This was in late summer of 1920. I have been told that Mr. K. had quit trying to immunize his pigs. Dr. Hastings does not state that the gilts were bred to these boars, but infers they were exposed by shipment in the same car from Bloomington to Williamsville.

He has stated to me that the best, pure-bred-hog men of his community have practically been forced out of the hog business on account of conditions such as he describes. Several other good practitioners have reported difficulty at breeding or farrowing time similar to that described in this report.

J. S. KOEN.

Massachusetts is credited with having one of the first sanitary acts, a quarantine regulation, passed in 1648.

UNUSUAL CASES IN GENERAL PRACTICE¹

By R. H. PARKER, *Gastonia, N. C.*

In the practice of any branch of medical science many puzzling problems are met and dealt with in various ways. To a certain extent we find ourselves operating a modern medical detective bureau, and the criminal most often sought is some type of bacterium, fungus, protozoon or parasite, either external or internal; less often the culprit is some poisonous plant, insect or reptile in this particular part of the world.

The search may lead one to all the hidden cavities of the body, to all the delicate organs either in the dead or living animal; it will include consideration of all outside phases of the case such as history, food supply, water supply, and care in general of the animals in question.

Perhaps we must summon aid to obtain a proper solution of the matter at hand and this aid will be the microscopist, the chemist, the botanist or some one of the many specialists, and even then we may find that, like other detective agencies, we sometimes fail, our search having been in vain, and we lay another medical mystery on the shelf to be mused over during our idle moments in days to come.

Looking back over my past experiences in practice I can well remember a few of those medical mysteries that I encountered from time to time, some of which I laid away unsolved with the little consolation of knowing that I am not the first nor last man to hit a stump in the field of veterinary medicine.

Three cases that I am narrating in this paper are cases that were unusually interesting to me because they were so different from the usual run of cases in practice. The first case is one that is paradoxical to the belief of all laymen and as far as I know to all veterinarians.

SNAKE BITE

One morning in August I was called to a small farm adjoining town to see a shoat weighing about ninety pounds. The history of the case was that the owner fed the hogs in this lot early in the morning and at that time all hogs were well and ate heartily. About forty-five minutes later the owner happened to be passing and noticed this shoat in distress.

¹Read before the ninth annual meeting of the Southeastern States Veterinary Medical Association, Greensboro, N. C., November 12-13, 1923.

At the time of my arrival I found this animal staggering and gasping for breath, and the region of the face and central part of the neck was greatly swollen. In a few minutes the shoat died and did so without any help from myself or owner, for we were discussing the case previous to a more careful and close-up examination.

I was somewhat at a loss to know just what could have caused such a sudden swelling and death in a shoat that was apparently perfectly normal two hours before. I held an autopsy and found the tissues of the face and forehead to be very hemorrhagic, the mucous membranes of the nose, throat and mouth were edematous and ecchymotic, a gelatinous exudate in the anterior mediastinum, petechial hemorrhages also in heart and kidneys. Death was due to suffocation caused by edematous swelling of throat. After the post mortem I could think of nothing that would produce a similar condition in such a short period of time except a snake-bite, or something of a like nature, and told the owner in a joking manner that we would have to diagnose it as a snake-bite.

The following morning I received an early morning call from the same man and found another shoat from the same litter with the same affection, the symptoms being the same except that the case was not progressing so rapidly; the animal dying some six or seven hours later. Another post mortem was held, the lesions found were the same, but this time the owner looked doubtful when my opinion was expressed.

The next morning I received another call from the same man and lost no time going, for by this time I was getting real interested and did not feel so positive about my diagnosis. This time I found another shoat from the same litter with similar symptoms, but less rapid going than shoat no. 2. I looked carefully over the face and nose of this animal for a bite, but because of the roughness of skin and the abundance of bristles I was unable to find any marks.

As the hog pasture was small and fairly free from rank vegetation I suggested that we look for a snake. We searched carefully for some time and were about to give it up when we chanced upon a real snake, a husky copper-head, some three feet long. This put an end to our snake and likewise to our hog troubles, for no more hogs were affected in this lot.

My theory is that this snake was in the habit of lying by the pig path that led up to the feeding-trough and at the approach of

the first hog he would strike it in the face and then crawl away. The strike was accurate enough to land in the face where circulation was sufficient to take the venom up rapidly, hence the results. Had the bite been in that part of the body that is covered by a heavy pad of fat the absorption would have been so slow that the poison would have caused no trouble.

LAUREL POISONING

The owner of a flock of sheep came to my office one morning in January and stated that he owned about forty-five head of sheep, and that twenty-four of these sheep had been purchased recently; that three head had died a few days before and these three sheep were a part of the twenty-four purchased and it was his opinion that this new flock was affected with some type of disease. He described symptoms but I could make no diagnosis from his description.

The next day he called me stating that two more sheep were sick. Upon my arrival I found these two sheep suffering with typical symptoms of laurel poisoning. These sheep were in one large lot some two or three acres in size with nothing to eat except that given them. The owner said it was impossible for them to have got any laurel, for the fence was good and they were never allowed out.

I ordered a treatment of flaxseed tea and lard, stating that I expected these animals to die and when dead I wanted to hold a post mortem. The next day I held a post mortem on these two sheep and found the rumen to contain plenty of laurel.

The owner was very much surprised for there was no laurel near. However, we learned a few days later that some girl students in a nearby dormitory had used laurel to decorate their rooms and as the decorations were discarded some would carry them to the sheep. The home-raised sheep most certainly had learned in some way to let laurel alone for none of them was affected.

YELLOW JASMINE POISONING

Early in March I was called to investigate the cause of losses in a herd of cattle. The number of cattle in this herd was about 100, ranging in age from two to six years. Most of them were of the beef type and had been shipped from Tennessee four months previously. They were fed on cotton-seed meal and hulls and some fodder, just enough to carry them through until

grass time. They ranged over a tract of about 100 acres of cane-brakes and brush land.

At the time of my visit they had lost eleven head in two weeks and some seven or eight were affected, being in the various stages of the disease. One carcass was available for post mortem, but when we finished it we knew just as much as before, for we found practically no lesions.

The symptoms observed in the seven or eight affected animals were as follows: First a general sluggish appearance that gradually progressed until a general weakness set in. Slight incoordination of muscles of locomotion, at first, which gradually became worse until the animal had the appearance of being intoxicated on some modern moonshine product from which the quarrelsome qualities had been extracted. Finally the animal would go down to stay. In a short time they would be comatose, death following in a few hours.

Some few were said to have convulsions. In all cases the eyes had a peculiar, drowsy appearance, in some the eyelids were half-closed and in all cases the pupils were more or less dilated. The pulse at first was full and slow, later weak and slightly accelerated. The appetite was only slightly impaired at first but later was absent. Bowels sluggish and costive in later stages.

In some cases the animal would partially recover, then relapse and die. The temperature was about one to one and one-half degrees above normal at first and then dropped to subnormal. Duration of sickness was from three days to a week.

After learning all I could from history and symptoms and taking into consideration that I found no lesions in the one animal posted I decided the trouble must be one of food or plant poisoning. The feed was examined and appeared good. The symptoms were such that I thought of poisonous plants, especially of the nightshade family.

Upon inquiry I found that native cattle had ranged this particular territory for years and the natives told me it could not possibly be due to plant poisoning for they had never had any such trouble. However, I had my doubts and remembering the lesson learned from the flock of sheep, I decided to take a look at the pasture. Not being a botanist and not being familiar with the various poisonous plants in North Carolina, I was somewhat at sea to know just what to look for.

After rambling over the pasture for some time I found a spot of about one-half acre that was irregularly covered with a vine-like shrub that was green and had the appearance of being in the state of just putting out. The cattle had been eating some of these leaves and these particular leaves looked suspicious to me.

I had no idea of the identity of this plant so took a sample to send to our State Department. I instructed the owner to take the cattle off this range until more information could be obtained and to give all affected cattle a large dose of saline purgative and some strychnin every three or four hours

A few days later we received a reply from our State Department stating that the plant in question was yellow jasmine. This is the plant from which the drug gelsemium is made. The symptoms of gelsemium poisoning, as given in our text-books, checked quite closely with those in this trouble. This solved the problem, for after this was grubbed up the trouble ended. All sick animals that were affected at the time of my visit made complete recoveries.

In closing I wish to state that I am inclined to think that native animals often learn to let certain poisonous plants alone, while imported animals often pay a penalty for not knowing. Our domestic friends may not be able to think, but they do show evidence of having good faculties to remember certain lessons taught them by Mother Nature.

DR. BOYNTON TO CALIFORNIA

Regents of the University of California recently confirmed the appointment, effective July 1, 1924, of Dr. W. H. Boynton, head of the Pandacan Research Laboratories in the Philippine Bureau of Agriculture, as Professor of Veterinary Science in the College of Agriculture. It is expected, however, that Dr. Boynton will arrive at a somewhat earlier date and begin at the University certain research operations under the terms of a leave of absence from the Philippine Government.

Widely known in the tropics for epoch-making work on rinderpest, Dr. Boynton has applied his methods to hog cholera and is reported to have succeeded, after years of labor, in producing a new vaccine not only "fool-proof" in its ease of administration but also, it is said, capable of conferring dependable immunity in almost every case. The vaccine is given by mouth, and may even be given with the food. The method will have its first public demonstration upon Dr. Boynton's arrival in California.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

AN UNCOMMON CASE REPORT IN A COW

By L. A. WILEDEN, Mason, Mich.

On December 2, I was called to visit a cow of the Durham breed, middle-aged and in good flesh. The history was that she had been in good health until the day before, when it was noticed that she refused her feed and the bowel movements were scanty. She had received no exposure or irregularity in care or feed.

The patient was lying down when I called, and grunting slightly. The paunch was full and firm, the nose dry but not hot, the contents of the rectum was dry, scant and coated with a slight amount of mucus. While examining the contents of the rectum, I also examined the fetus in the uterus, as the owner stated she was due to freshen on the last of the month. The fetus was alive and in normal position.

I made a diagnosis of impaction and gave a package of Bovine Hydrogogue (LaFayette Pharmacal Co.), dissolved in 32 quarts of water, through the esophagus, with the stomach-pump. I injected 16 quarts of warm, soft water, containing a little soap, into the rectum, as a deep enema. I left six tablets, each containing barium chloride 30 gr., tartar emetic 30 gr., and strychnin sulphate $\frac{1}{4}$ gr., with directions to give two tablets night and morning. I also left a powder containing nux, gentian, and filled with artificial Carlsbad salts, and directed two tablespoonfuls to be given four times a day, in a drench. I ordered all feed withheld till the physic acted, and then to give only slops or mashes until she improved. I had a pail of fresh water placed in front of her often.

I heard no more of the case until on the 9th, when a neighbor, who had been taking care of her while the owner was called away, called me up, stating that the cow was no better. No apparent change had taken place in the case. No bowel movement, appetite, or thirst. I repeated the treatment described above. The fetus was alive, normal and in position.

Twenty-four hours later the owner returned, and came to the office, stating that there was no change. I prescribed powdered aloes and glauher salts, equal parts, and directed that four tablespoonsful be given in a quart of water every four hours till the bowels moved.

I was called out again the 11th, and found the cow weaker, eyes sunken, no feces in the rectum, calf alive and normal in the uterus. The paunch was softened a little and peristalsis audible on the right side. I gave another package of physic through the esophagus with 32 quarts of water, and injected 16 quarts of warm, normal, salt water through the trocar into the paunch, also a normal-salt-water enema. I told the owner to keep up the tablets and tonic, and to tempt her with anything he thought she would eat.

On the 13th he called me out, and said she had drunk four quarts of water and eaten about a handful of sliced beets and bran. There was no marked change in her condition otherwise. I repeated the package of physic and 32 quarts of water through the esophagus, and gave a salt-water enema, and informed the owner that I was afraid of a mechanical obstruction and had done everything I knew how to do. The calf was still alive.

The owner came to the office on the 17th, and, reading a smile on his face, I asked the news. He said that on the night of the 15th he gave her a dose of medicine, and, as she was about to collapse, he turned her out into a covered, straw barn, so that if she died he could haul her more easily, and gave up all hopes. The next morning, instead of finding a dead cow, he found she had given birth to a normal, heifer calf, and it was nursing, and she was running off at the bowels in great style. This continued twenty-four hours, and she returned to food and water and made an uneventful recovery.

I am still puzzled to know what was the matter.

PASSING THE SOUND ON THE BULL

By E. E. WEGNER, Pullman, Wash.

Dean, College of Veterinary Science, State College of Washington,

We have labored under the impression, for many generations, that it was impossible to pass a sound or a catheter on the bull, because of the double curve that takes place when the organ of the bull is in the resting stage. It is sometimes convenient to

locate obstructions, particularly calculi, that float out from the bladder and become caught somewhere in this duct. We have assumed that they are most likely stopped at the first curve of the S, but previously have had no means of knowing their exact location. The writer has been of the opinion for some time that it would be possible to pass a catheter on this animal and has applied to various instrument houses urging them to make a waxed linen catheter of about the size used for the dog, but four and a half or five feet long. The reply has inevitably been that such catheters were made in Europe only and that such could not be procured in the United States.

That being the case investigation was made to determine if there was not some kind of a sound that could be used to demonstrate whether or not the passage of this instrument was practical. The best results are obtained by using a number 20, lead, fuse wire that may be obtained from any electrical shop. Heat the end until it is somewhat expanded, making a proper ball- or knob-shaped point. This lead sound is very easily bent and will follow any tube that is reasonably straight.

To pass the sound cast the animal and confine it by tying front and hind feet of the same side together. This exposes the abdomen and shortens the antero-posterior dimensions of the belly. Protrude the organ from the sheath in the usual manner and as soon as the end appears grasp it with a moist towel and draw it out from the sheath a distance just far enough so that it can be firmly grasped with the entire hand. This is as far as is necessary to obliterate the S-shaped curve that occurs in the resting condition. The sound then properly lubricated may be passed into the urethra and easily passed the full length of the organ in the bull. At the ischial arch it may be necessary to manipulate the sound a little bit to make it pass this rather sharp curve, but with a small amount of manipulation it will pass around it and will enter the bladder directly.

I feel perfectly safe in saying that while we have not used this method a great deal and it is still somewhat new, that we have experimented with it enough to demonstrate that it is altogether practical and that it could be used to good advantage in cases where there is obstruction of the urethra, and the obstructing object could be located accurately so that the operator would know exactly where to make his incision to relieve the condition. I am equally sure that as soon as we can have proper

catheters made for this animal, that it is entirely practical to draw the urine from the entire male of the bovine species.

This demonstration was one of a number of demonstrations that were made at the Post-Graduate School for Veterinarians at the College of Veterinary Science of the State College of Washington on January 16, 1924. It is really quite astonishing that we have so long held the opinion that this was impossible, because the very simplicity of it will make you wonder that this has not been done these many generations.

DRASTIC ACTION

One of our members who has experienced great difficulty in collecting his accounts the past year recently adopted dernier measures to get his clients to pay up. To each client, with an unpaid account, he sent the following notice:

BECAUSE we are paying interest on \$12,000 in order to carry the accounts of our clients who do not pay their bills;

AND BECAUSE the payment of our own bills, when due, and our living depends upon the collection of money due us;

AFTER January 1, 1924, WE ABSOLUTELY WILL NOT make a call on a place where they have an account with us over thirty days old, UNLESS SATISFACTORY ARRANGEMENTS HAVE PREVIOUSLY BEEN MADE.

Your account on our books shows \$.....

At about the same time an ad. was placed in the local paper, stating that accounts, past due on February 1, would be offered for sale.

We are advised that the plan worked.

FROZEN REINDEER MEAT

The carcasses of 33 reindeer, slaughtered on St. Lawrence Island, Alaska, by Government officials, were recently received at Spokane, Wash., and placed on sale in public markets. The carcasses were shipped whole, frozen solid, with hides on. To preserve the flavor and juice of the meat the carcasses were cut up and sold without thawing. This is a recent experiment of the Government in an effort to utilize reindeer meat for domestic consumption.

REVIEWS

THE AGE OF THE HORSE. J. L. Frateur, Professor at the University and Director of the Institute of Zootechny, Louvain. Authorized translation by G. Mayall, M. R. C. V. S. 65 pages, with 27 colored plates by E. Tschaggeny. Bailliere, Tindall and Cox, London, and Alexander Eger, Chicago, 1923. Price \$1.00.

It has been the aim of the author of this little manual to make available a practical guide for the determination of the age of the horse by the teeth. The book is divided into three parts, the first dealing with the anatomy of the teeth, the second, the major portion, being devoted to the subject in hand, and the third containing a brief review of dental irregularities.

The colored plates illustrating the different ages of the horse are by the celebrated animal painter, Edmond Tschaggeny. For those veterinarians who now only occasionally see a horse, this little book will serve as a handy memory-jogger between times.

DISEASES IN CAPTIVE WILD MAMMALS AND BIRDS. By Herbert Fox, Pathologist to the Zoological Society of Philadelphia, Director of the William Pepper Clinical Laboratory, University of Pennsylvania. 665 pages, with 28 tables and 31 graphic charts in the text, and 87 figures. J. B. Lippincott Company, Philadelphia, 1923.

Here is a book that is unique. It will fill a space that has been empty in our veterinary libraries. It is equally of interest and importance to the biologist and the pathologist, veterinary, human, or comparative.

The material in the book represents twenty-two years of work, observation, study and record-keeping in connection with the wild animals in captivity at the Philadelphia Zoological Garden. As pointed out in the foreword, by Dr. Charles B. Penrose, president of the Zoological Society of Philadelphia, the animals studied "have not been subjected to experimental procedures and conditions, and though their mode of life has not been that strictly natural to them, yet they have not been influenced by any of the artificial procedures of the laboratory which are usually followed in investigations on animals."

The book is divided into eighteen sections, dealing with diseases and conditions of the various systems of the body. One section deals with the relation of diet to disease. Another covers the incidence and significance of animal parasites. Under the infectious diseases, tuberculosis takes up 75 pages.

In the section dealing with the female reproductive organs, the statement is made that examples of abnormality and disease are not very numerous. Further, it is stated that abortion and miscarriage are occasionally seen in the monkeys, rodents and ungulates, with the cause seldom determined. It would appear that no mention is made of breeding problems, sterility, and the possibility of infections of the genital tract, such as we have in domesticated mammals. Maintaining these wild species, through proper reproduction, under artificial conditions, would appear to be a real problem, although this is not indicated by the text.

To attempt even to mention the interesting conditions encountered by Dr. Fox and described in his book would be absolutely impossible in the space available. We commend the book to veterinarians. It is a distinct contribution to our literature.

ABSTRACTS

SPECIATION AND HOST RELATIONSHIPS OF PARASITES. Chandler, Asa C. (1923). *Parasitology* (London), 15 (3), pp. 326-339.

According to Chandler, two diverse tendencies are displayed amongst parasitologists at the present time with regard to the questions of speciation and host relationships of parasites. One tendency is to look upon parasites living in two different hosts, or in two different habitats in or on a single host, and more or less constantly showing slight morphological differences, as distinct species until there is some positive evidence for considering them identical; the other tendency is to consider such parasites as identical until definitely shown to be distinct.

Until recently the former tendency has been more pronounced. However, with the growing evidence showing that when a parasite is transferred to a different host it may undergo certain morphological changes which are more or less constant so long as it remains in or on the new host, together with increasing evidence that parasites in the course of a few generations increase their adaptability to a given host, a tendency in the opposite direction is becoming evident.

Some of the parasites affected by the above consideration are species of the genera Sarcoptes, Chorioptes, Psoroptes, Demodex, Pediculus, Hymenolepis (as regards *H. nana* and *H. nana fraterna*), the Leishmania-Herpetomonas-Trypanosoma group of flagellates, Trichomonas, Giardia, Endamoeba and the Rickettsia-like organisms. The known facts favor an extensive recognition of the impurity of species in nature, of the instability of the physiological and morphological characters of parasites as well as of other animals, and of the consequent inconstancy of infectivity and pathogenicity.

For this reason it would be wiser to await some positive evidence of the multiplicity of species of closely related species of parasites living under different environmental conditions before elevating those parasites to the rank of species and giving them specific names. At the same time, parasites from different hosts and habitats should not be lumped together, as inaccurate determinations impair the value of many scientific observations. The use of a trinomial system of nomenclature, using varietal names for closely related forms from different hosts and habitats, is a course especially adapted to the needs of such cases existing in the field of parasitology.

M. C. H.

FURTHER INQUIRIES INTO THE ZOOLOGICAL STATUS OF THE
POLYMORPHIC MAMMALIAN TRYPANOSOMES OF AFRICA, AND
THE MEANS BY WHICH THEY ARE SPREAD IN NATURE.
Duke, H. L. (1923). Parasitology (London), 15 (3), pp.
258-295.

Duke concludes that the present system of classifying the mammalian trypanosomes is unsound and needlessly complicated. Many species, so-called, are really strains, races or varieties of a single wide-spread species, the differences found being determined by environmental differences. (In this connection, see the review of Chandler). The sound characters are the morphology and the developmental behavior of the parasite in the intermediate insect host. On this basis, the trypanosomes in question fall into three main groups as regards their development in species of Glossina. These groups are the "proboscis-only," "proboscis-and-gut," and the "gut-and-gland" groups, with the corresponding and characteristic morphology of the *vivax-uniforme* type, the *nanum-congolense* type and the polymorphic type. *Trypanosoma vivax* and *T. uniforme* are morpho-

logically distinct and seem to be good species. *T. nanum* and *T. congolense* (—*T. pecorum*) appear to be physiologically different strains of a single species. *T. brucei*, *T. gambiense* and *T. rhodesiense* appear to be physiologically different strains of a single species. *T. evansi*, *T. equinum* and *T. equiperdum* appear to be difficult to classify.

The relations of wild game to trypanosomes are very complicated and many factors must be taken into consideration in determining whether the advantages of the presence of game in Africa outweigh the disadvantages or not. Duke believes the best line of attack on trypanosomes at present is through an attack on the fly rather than on the game.

The subject of the possible importance of direct transmission in determining the virulence and spread of trypanosomes in nature is emphasized.

M. C. H.

A REFERENCE LIST OF THE TREMATODE PARASITES OF BRITISH BIRDS. Nicoll, William (1923). Parasitology (London), 15 (2), pp. 151-203.

A REFERENCE LIST OF THE TREMATODE PARASITES OF BRITISH MAMMALS. Ibidem (3), pp. 236-252.

These are comprehensive lists of parasites and hosts, and are of great value, especially to parasitologists in Great Britain. They would have even greater value to parasitologists if they contained notations showing which of the parasites listed had actually been found in Great Britain in the hosts listed. (In the list of bird trematodes, *Metorchis crassiusculus* is listed from the domesticated duck. The only record of the sort known to the reviewer is in a paper by Kholodkowski (1902), and in a reprint of that paper in Dr. Hassall's library there is a correction, in ink, apparently by Kholodkowski, changing the record to *Metorchis xanthosomus*. On the evidence available to the reviewer it does not appear that *M. crassiusculus* has yet been found in the domestic duck.)

M. C. H.

A NEW GENUS OF NEMATODES FROM THE DOMESTIC RABBIT. Graybill, H. W. (1923). Parasitology (London), 15 (3), pp. 340-342, pl. xi.

This paper describes *Obeliscus cuniculi* n. g., n. sp., from the stomach of the rabbit at Princeton, New Jersey. The genus is

said to be close to *Graphidium*, but the spicules are not so distinctly filiform, there is a definite dorsal lobe in the bursa, the bursal rays are not uniformly and symmetrically spaced (the latero-ventral curves away from the ventro-ventral and then recurves so that the tips are close together; the medio-lateral and postero-lateral rays are close together and somewhat remote from the externo-lateral), and the externo-dorsal ray is short instead of long and prominent as in *Graphidium*. The worms are white, except for a dark streak due to the intestinal coloring; the male 1 to 1.4 cm. long and the female 1.5 to 1.85 cm. long.

M. C. H.

TIME REQUIRED FOR FOOD TO PASS THROUGH THE INTESTINAL TRACT OF FOWLS. B. F. Kaupp and J. E. Ivey. Jour. Agricultural Research, xxiii (1923), pp. 721-725.

A study was made of the time required for the passage of food through the digestive tract of poultry. In this experiment different substances were used to stain the food materials. It would seem that lamp black gave about the best results. The gentian violet and the methylene blue seem to exercise some influence upon the normal function of the intestinal tract. Hens were started on this experiment after allowing one day's confinement without food.

It is interesting to note that the time of passage of food varied in laying hens, hens which were not laying, and in broody hens. The average time required for the food to pass through the intestinal tract of growing fowls was 3 hours and 52 minutes; laying hens, 3 hours and 46 minutes; the adult hen, not in laying condition, 8 hours; and the broody hen, an average of 11 hours and 44 minutes. The broody hen showed the same results whether confined to coops or on nest.

L. W. G.

STUDIER ÖVER FRAMSTÄLLNING AV ANTITOXISKA SERA. (Studies on the Production of Antitoxic Sera). Edwin Lehnert. Skandinavisk Veterinär-Tidskrift, Uppsala and Stockholm, 1922, 12, 190-198. (Reprinted from Abst. of Bakt.)

This is a discussion of the methods employed in the State Serum Institute, Copenhagen, Denmark. The effect of the hydrogen ion concentration on toxin production, and thus indirectly on antitoxin production, is also dealt with.

H. J. S.

ASSOCIATION MEETINGS

CALIFORNIA VETERINARY PRACTITIONERS' WEEK

The annual Veterinary Practitioners' Week in California was held at the University Farm at Davis, January 7-10, 1924. One hundred six veterinarians were registered during the period. Colorado, Oregon, Nevada, Iowa, and even Hawaii were represented. The four days were filled from 8:30 a. m. until after 10 p. m. with lectures and demonstrations on many phases of veterinary medicine. It was truly a practitioners' program and the interest and enthusiasm equalled if not exceeded that of previous courses.

The special lecturers included Dr. T. H. Ferguson, Lake Geneva, Wisconsin, Dr. Maurice C. Hall, Senior Zoologist, U. S. Bureau of Animal Industry, Dr. K. F. Meyer, Professor of Research Medicine, University of California and Acting Director of the Hooper Foundation for Medical Research in San Francisco, and Dr. W. Pffenninger of the Veterinary Medical Faculty of the University of Zurich. In addition to these men Federal and State officers, members of the faculty of the University of California, and private practitioners contributed to the program.

Special attention was given to diseases of cattle, hogs, poultry, and small animals. Sheep and horses received honorable mention however on a number of occasions, particularly in the lectures on parasites by Dr. Hall, and in the address by Colonel W. G. Turner, V. C., U. S. A. on "Methods of Inspection for the Purchase of Horses for the U. S. Army."

The operations performed and the practical lectures given by Dr. Ferguson on diseases of cattle were especially interesting to the practitioner. Various diseases and abnormalities of the udder of the cow, including mammitis, teat tumors, fistulae, strictures, etc., were discussed and curative surgical procedures demonstrated. Complete extirpation of the udder marked the climax to discussions and operations on this important organ of the cow.

The diseases and accidents that occur to the head of cattle were also covered in a most satisfactory way. By way of demonstration of some of those disturbances, Dr. Ferguson showed and operated upon a case of actinomycosis of the inferior maxilla. The case was so advanced that the prognosis was unfavorable.

However the operation was performed by chiseling away a large part of the honey-combed mandible and by removing all the visible diseased foci. At this writing (28 days after) the case is well on the way to recovery.

Although not on the program an advanced case of traumatic pericarditis was fortunately (for the veterinarians) available. Dr. Ferguson, by the use of chloral hydrate, given by the stomach-tube, and local anesthesia, performed rumenotomy and extracted a handful of varied kinds of hardware, including hairpins and small staples, from the reticulum. In addition to this he passed a trocar into the pericardial sac and drew off about 2 liters of purulent serum. Prognosis was decidedly unfavorable before operation, and upon autopsy forty-eight hours later the reticulum was found clear of foreign bodies, but the well-known lesions common to this disorder that were found left no doubt but that death could not have been prevented.

Dr. Ferguson finished his four days of strenuous work by a cesarian operation on a cow. This was also performed under chloral hydrate and local anesthesia. Had time been available, and had the cases at Davis lasted, the veterinarians of California would have enjoyed hearing him speak and watching him operate for a much longer time. Opportunities for demonstration at other places in the state would have been available but Dr. Ferguson had appointments to lecture at Pullman, Washington, the following week.

Dr. Hall brought to the veterinarians of California a subject always of importance, but one which has seldom appeared on their programs. The parasitic diseases of animals, which was the general topic of his lectures, are always of special interest, but more than that the veterinarians in California were gratified to hear and see the man whose investigations in the field of parasitology were so well known by the printed word and by their practical application.

To review the information which Dr. Hall left with the practitioners here would far exceed the space available for this report. But every veterinarian has a broader and more accurate conception of the advances that have been made in this field and of the relations of parasites to disease in general than they ever had before. The importance of the prevention of parasitic infestation, especially to the young, was stressed by Dr. Hall and the great mortality in infant live stock due to parasites was pointed out to

be in considerable extent preventable by the application of newer knowledge of the life histories of many parasites.

One period of the course was given over to laboratory practice in the examination of feces for parasite eggs. Coincident with Dr. Hall's lectures in Davis, a young woman died from trichinosis in the Woodland Sanitorium, ten miles distant. The mother also was not expected to live. Infestation occurred through the tasting of raw sausage being prepared on the ranch. A piece of the diaphragm of the young woman was brought to Davis and many parasites were demonstrated. By way of further emphasis to the importance of Dr. Hall's subject the interesting B. A. I. films, "The Ox Warble" and "Stable Flies and Their Control," were shown during one of the evening sessions.

One of the outstanding features of the "Practitioners' Week" this year was the address of Dr. W. Pfenninger, of the Veterinary Medical Faculty of the University of Zurich, on the subject "Our Present Knowledge Regarding White Scours and Similar Diseases of Calves." The veterinarians of California are to be congratulated upon the privilege of having heard this original paper. The opportunity was offered because Dr. Pfenninger is visiting the United States and was in California. No more complete review of the scientific knowledge upon these important diseases of calves has ever been given in this country. It is hoped that the paper will be printed in the not distant future.

Dr. K. F. Meyer, whom the veterinarians are always glad to hear speak, gave a most interesting talk on "Medical and Non-medical Experiences in Europe." Dr. Meyer has recently returned from a year of traveling in Europe, where he visited most of the countries in which important research upon disease is being conducted. In England he observed an outbreak of botulism in human beings and advised with the authorities in methods of preventing future occurrences. The grass disease of animals in Scotland was also observed. In many respects this disease resembles botulism. He stated that there is no money for research in most of the countries of Europe. The research workers are unable to purchase experiment animals and many of the men are spending their time in writing only.

The poultry industry of California is a highly specialized one. Many districts are particularly adaptable to poultry raising and in certain of these areas this industry is highly developed. Because of this fact and also because the veterinarian can be of service to the poultry raiser and to himself as well, the subjects

of poultry raising and the diseases of fowls occupied an unusually prominent place on the program. The topics of "Poultry Breeding," "Poultry Housing" and "Poultry Feeding" were discussed by Professor A. W. Lippencott, of the University of California. Some of the diseases of poultry were handled by Dr. J. R. Beach, of the Division of Veterinary Science, under the title of "Nutritional Diseases of Poultry."

On the last day of the course Dr. Elmer Drew Merrill, recently appointed Dean of the College of Agriculture of the University of California, made his first appearance before a California audience. Dr. Merrill comes from the Directorship of the Philippine Bureau of Science at Manila. During his address public announcement of the appointment of Dr. W. H. Boynton, head of the Pandacan Research Laboratories, in the Philippine Bureau of Agriculture, to a professorship in Veterinary Science in the University of California was made.

Dr. Merrill stated that Dr. Boynton had perfected a vaccine for the prevention of rinderpest that was practically 100 per cent efficient and that the same principles when applied to the preparation of a vaccine for hog cholera produced equally good results. The vaccine for hog cholera is inexpensive of preparation and produces immunity to the disease through oral administration. It is expected that Dr. Boynton will begin the preparation of the hog cholera vaccine at the University of California and his researches in the prevention of other animal diseases along similar principles about July 1.

F. M. HAYES.

UNIVERSITY OF PENNSYLVANIA VETERINARY CONFERENCE

The annual conference of veterinarians at the University of Pennsylvania was held, January 8-9, 1924, with an attendance of two hundred.

The first session was devoted to poultry diseases and management. Dr. F. R. Beaudette, of the New Jersey Experiment Station, gave a very interesting talk on "Differential Diagnosis and Control of Poultry Diseases," accompanying his remarks with several cleverly executed autopsies. This was followed by a talk on "Poultry Management Principles of Importance to Veterinarians," by Mr. Paul M. Guldin, of Yellow House, Pa. This session was one of the outstanding features of the conference.

In the afternoon, the program provided much interesting material along the line of milk and meat hygiene. The first speaker, Dr. Vincent C. Moyer, of the Supplee-Wills-Jones Company, discussed "Dairy Inspection for a Large Milk Distributor." Next Dr. George W. Grim, Ardmore, Pa., gave a lantern-slide talk on "Supervision of the Commercial Pasteurization and Distribution of Milk." The slides illustrated the machinery and equipment used in a modern milk plant and proved very instructive.

"The City End of Milk Hygiene Work," by Dr. H. B. Roshon, Reading, Pa., and "The Milk and Meat Inspection System of Reading, Pa.," by Dr. E. E. Romberger, proved conclusively that Reading must be a pretty healthy residential section. It also proved a splendid tribute to the efficiency of veterinary service along public health lines.

The concluding paper in this session was entitled "Meat Inspection in a Large City." It was presented by Dr. E. E. Behrens, Supervising Meat and Cattle Inspector of Philadelphia. To prove that Philadelphia was not to be outdone by Reading in protecting its inhabitants from improper meat, we learned from Dr. Behrens that his force of inspectors condemned as unfit for human consumption, thirty-two (32) tons of turkeys just before Thanksgiving of last year, because of improper packing and shipping and consequent spoiling.

The evening session was opened by a talk on "Veterinary Service from the Stockman's Viewpoint," by Mr. E. S. Bayard, Editor, National Stockman and Farmer. Mr. Bayard in his usual, inimitable style won our hearts. He gave us a lot of good advice and friendly criticism, in a witty manner. "Don't call our sick pets 'cases,' because to us they are very dear, both from an economical and a sentimental standpoint," said Mr. Bayard. Following this address, a smoker-luncheon was given in Leonard Pearson Hall.

At the opening session of the second day, Dr. Edward Lodholz, of the Graduate School of Medicine, gave a scholarly address on "Internal Secretions: their Meaning, their Action, their Value." The subject of Endocrinology is growing by leaps and bounds, leaving most of us in a bewildered state of mind concerning it. Dr. Lodholz did much to clarify the situation by summarizing the subject in a clear, scientific manner.

We were next entertained by a talk on "Sheep Industry and Flock Management in Pennsylvania," by Mr. W. B. Connell, of

Pennsylvania State College, who impressed us with the magnitude of the sheep-raising industry. The United States produces less than half of the wool it uses, a lamentable fact. Though there has been a falling off in sheep-raising in Pennsylvania, its one-half million sheep produced \$5,000,000 income in 1923.

Dr. John W. Adams spoke on "The Actual Cautery in the Treatment of Inflammation of Tendon, Ligament, and Periosteum." It was a very interesting, practical talk, the kind with which Dr. Adams always holds his audience.

The final session was given to small animal practice. The first paper, entitled "The Non-Descendent Testicle in Small Animals," by Dr. Frank H. Miller, New York, emphasized the importance of an early operation to remove the organ because of the tendency to malignancy. Six months of age is the limit of time to wait for the organ to descend naturally.

Dr. Bruce Blair, New York, followed with "Some Observations in Small Animal Practice, in Clinic and Hospital, During a Period of Ten Years." Dr. Blair discussed many of the ordinary ailments which he has encountered. This and the preceding paper provoked considerable discussion and many interesting points were brought out to our mutual enlightenment.

The last number on the program was a lantern-slide talk by Dr. H. W. Barnard, Lancaster, Pa., on "The Dog Hospital as a Hobby." The slides showed various plans and specifications as well as the finished product of ideal small animal hospitals.

V. G. KIMBALL, *Recorder.*

MAINE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Maine Veterinary Medical Association was held at the Congress Square Hotel, Portland, Maine, Jan. 9, 1924.

Those present were: Drs. C. F. Davis, E. V. Estes, M. E. Maddocks, M. H. Potter, W. H. Robinson, F. L. Russell, E. E. Russell, H. L. Stevens, C. W. Watson, H. B. Wescott, N. W. McCaughey, J. B. Reidy, R. E. Libby, Dr. J. M. Buck, B. A. I., Washington, D. C. and Mr. H. M. Tucker, Chief, B. A. I., of Maine.

It was moved and voted that the Secretary send bills for Association dues to members in arrears, and that some action be taken at the July meeting on any members who then owe for dues more than two years.

Dr. J. M. Buck presented a paper on "Bovine Infectious Abortion and Its Control." This paper was a masterpiece of arrangement of the known facts regarding the disease and showed a thorough personal knowledge of the malady. Dr. M. E. Maddocks read a paper entitled "Fright Disease of Dogs." Dr. P. R. Baird presented a paper, "The Horse *vs* the Tractor." Following the papers, a general discussion of the subjects took place, especially of the paper on abortion disease.

Officers elected for the year 1924 were: President, E. E. Russell; Vice-President, C. L. Ryan; Secretary-Treasurer, P. R. Baird.

The next meeting of the association will be held in Waterville, April 7, 1924.

P. R. BAIRD, *Sec'y-Treas.*

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY

The fortieth annual meeting of the Veterinary Medical Association of New Jersey was held at the Columbian Club, Jersey City, N. J., January 10, 1924. The meeting was called to order by President Haffer. He gave a short address, extending to all wishes for a prosperous year. One charter member was present, Dr. A. W. Axford, of Chester. The regular order of business was suspended and the literary program was enjoyed for the first part of the day.

Dr. Edward A. Cahill, Vice-President of the Pitman Moore Co., gave an interesting talk on "The Use of Biological Products."

Some of his remarks were: Biologics have been used too generally. They came into use very rapidly and the practitioner had not taken too great pains to diagnose his real condition. Together with the producers' illuminative advertising things were overdone. Now we are undergoing a reaction and the practitioner is inclined to say that biologics are no good.

Bacterins and vaccines are valuable in some conditions, viz: the old-tried tetanus antitoxin, hog cholera serum and virus, rabies vaccine, etc. Canine distemper bacterin is good, in the right place and at the right time. Mixed infection bacterins are good if diagnosis is correct and they are used right. To illustrate: Anti-blackleg serum gives immunity for ten days only. It should not be expected to do better than that. Baby pigs

should not be immunized. Two things cause most of the so-called "breaks"—lack of virus and too young a pig.

The profession has been criticized because of the fact that one dose is expected to do the work of a real immunizing process. The first dose gives 30% immunity, the second dose gives 75% immunity and the third dose gives 85%. The tendency to give one large dose is wrong. The "drop," or negative phase, is too great after a large dose of most bacterins; not only too low but also 50% longer than it should be. Geographic conditions may be a factor in the control of disease but the user may be and probably is a greater factor.

Dr. John von der Leith, Chief Bacteriologist to the Hudson County Board of Health, spoke on "The Rabies Situation." Rabies is more widespread in Hudson County than ever this year. Probably all of the municipalities in New Jersey are infected. In 1923 there was over one dog's head a week, that had rabies, examined by the Hudson County Board of Health. There were over 900 police-reported cases of people bitten by rabid dogs and treated at the Hudson County Hospital, almost three every day. Essex County probably has more infection than Hudson. Dr. von der Leith advocated a state-wide ordinance, a better home control of dogs and a more rigid regime of picking up stray dogs by the police. He urged this Association to take an active part in stamping out rabies and in bringing the situation before the public.

Dr. George W. Little, formerly Chief Surgeon of the A. S. P. C. A., New York, read a paper entitled "Relation of Diet to Diseases in the Dog." He said that milk is the perfect food, and that most all dogs will take it. Meat and milk should be the main foods. Hunting dogs should have an abundance of meat. House dogs should have some at all times but not so much as hunters. The prohibited foods are: Liver, pork, ham, bacon, fried eggs, raw fish, cake, sweets, candy. The undesirable foods are: Potato, chicken, dog biscuits, veal, rice.

Wheat starch does not supply the necessary vitamins. Most dog crackers or biscuits are of wheat flour and dehydrated meat, which is of no value as a food. Excellent foods are beef, cooked or raw, lamb or mutton, spinach, cauliflower, steamed cooked onions, cabbage, hominy or corn cakes, oatmeal, raw eggs, milk.

A diet for a three-months-old puppy: One raw egg, one cup of milk, one zwieback, one teacup of broth, one teacup of oatmeal or wheatena, slice of bread, onion, spinach, or cauliflower.

Morning: Egg, milk and oatmeal.

11 a. m.: A bone.

Noon: Beef broth, bread, teaspoonful of chopped meat, onion, spinach or similar vegetable.

5:00 p. m.: Another bone.

6:00 p. m.: Duplicate the noon meal.

10:00 p. m.: Cup of broth.

An average-size dog, at six months, should have $\frac{1}{4}$ lb. of meat; at nine months, $\frac{1}{2}$ lb. of meat, besides the other foods. Use lime water instead of sulphur water. Malted milk tablets make excellent food for tiny dogs.

Dr. O. E. McKim, from the Research Laboratories of Dr. Fenton B. Turek, New York City, spoke on "Prenatal Poisoning caused by Tissue Extracts; 'Cytost' and Its Effects." All prenatal poisoning is the same. Disease, starvation, etc., result in the same condition of the cell. The etiological factor of disease is biological in form due to "cytost" or tissue extract. All disease has the same effect by liberating "cytost." Only extracts of the same species affect the animal. "Anti-cytost" produces immunity. The amount of immunity the parent has certainly affects the offspring, a marked degree of immunity being apparently transmitted. Immunity lasts to certain definite ages in the lives of families according to present experiments. Injections of "anti-cytost" carry them on beyond this stage.

Dr. Charles H. Higgins, Lederle Laboratories, New York City, addressed the Association on "Poultry Problems and the Veterinarian." Fifty per cent of the chickens hatched die shortly after hatching. Parasites are a larger factor in the death of chickens than realized by many. Urates cause white diarrhea. Fast all chicks for 24 hours, then start on whole grain; stay away from soft grain in small chicks. Take the load off of the digestive tract and the chick will live. Our modern incubator is not a really efficient machine. The Chinese, with their sand-boxes, beat us out. Turkeys that once have "blackhead" are always carriers.

Dr. James M. Herron, Bordentown, gave "A Synopsis of Bovine Practice." This was a good practical talk for practitioners. He advocated making a 4-inch incision in the skin in cases of tympanites of the rumen. A portion of the uterus is most always on the left. Put cow on right and insert hand; then have assistants turn her over. In bad cases of prolapse of uterus he advocated inserting a tracheal tube to prevent straining. The condition of "swelled head," rather frequently seen, of which we are all at a loss to know just what is the cause, and just what makes it disappear as quickly as it appears, he believes comes from silage feeding.

Dr. W. Reid Blair, of New York City, gave an interesting illustrated talk on "Wild Equines of the New York Zoological Park."

The annual dinner was enjoyed, there being about sixty-five that sat at one large table. There was to be a joint meeting of the Legislative Committee, and a special Rabies Committee was to meet within the next two weeks and endeavor to frame proper legislation to control rabies and have it acted upon.

In the absence of Dr. E. W. Smillie, who is resident secretary of the A. V. M. A., Dr. Silvester urged those present to become members and to take an active part in that association.

The officers elected for the following year were: President, J. W. Haffer, of Paterson; First Vice-President, A. W. Smith, of Orange; Second Vice-President, J. M. Herron, of Bordentown; Treasurer, H. Ticehurst, of Tenafly; Secretary, P. B. Silvester, of Princeton.

The semi-annual meeting will be held in Asbury Park, N. J., on July 10-11, 1924.

P. B. SILVESTER, *Secretary*.

SIXTEENTH ANNUAL CONFERENCE FOR VETERINARIANS AT CORNELL UNIVERSITY

The sixteenth annual Conference for Veterinarians at Cornell University was attended by more than the usual number and close interest was manifested in the program from start to finish. The topics of the papers show the range and variety of subjects covered.

The program opened Thursday morning, January 10, 1924. Dr. G. S. Hopkins presided and the opening address was made by Dean V. A. Moore.

PAPERS

"Posterior Paralysis in Swine" (Illustrated), by Dr. S. A. Goldberg. Discussion opened by Prof. L. A. Maynard, College of Agriculture.

"The Colon Bacilli of the Alimentary Tract of Normal and Diseased Calves," by Dr. C. M. Carpenter.

"Castration and Growth," by Dr. P. A. Fish.

"Functional Disorders and Their Possible Relation to Breeding Efficiency," by Dr. Cassius Way, of New York City.

Dr. Sutherland Simpson, of the Medical College, who has been working for a number of years upon the endocrine system, offered some remarks and exhibited specimens supplementing Dr. Fish's paper.

Luncheon was served at 1:00 p. m.

At the afternoon session Dr. D. H. Udall presided.

PAPERS

"The Blood, Urine and Tissue Juices of the Horse in Azoturia" (second report), by Dr. C. E. Hayden.

"The Physical Examination of Cattle in Dairy Inspection," by Dr. John McCartney, of Middletown, N. Y. Discussion opened by A. K. Zellner, C. I. Corbin and Dr. Ross.

"The Veterinarian in the Production of Clean Milk," by Dr. A. G. Hall, of Earlville, N. Y.

"Tuberculin Testing by Accredited Veterinarians," by Dr. Charles Linch, of the Department of Farms and Markets, Albany.

"Some studies on Intradermal Tuberculin" (Illustrated), by Drs. W. A. Hagan and J. Traum.

"Exit Ascaris." (Film furnished by the United States Department of Agriculture.)

The Thursday evening program was opened with an address of welcome by President Livingston Farrand, which was followed by a paper entitled "The Value of Roughage in Feeding Animals," by Prof. E. S. Savage, of the Department of Animal Husbandry, College of Agriculture. The usual smoker followed.

FRIDAY MORNING, JANUARY 11, 1924

PAPERS

"Poultry Diseases," by Dr. E. L. Brunett.

"Intussusception in Dogs," by Dr. H. J. Milks.

"Dog Practice Hints for the General Practitioner," by Dr. Frank H. Miller, of New York City.

"An Experimental Study of the Bang Abortion Disease in Cattle" (Illustrated), by Drs. R. R. Birch and H. L. Gilman. Discussion opened by Dr. W. L. Williams.

"Prevention of Disease of Newborn Calves," by Dr. D. H. Udall. Discussion opened by Dr. J. N. Frost.

The alumni association meetings followed, with luncheon at 1:15. The Friday afternoon session was given over to demonstrations in the different departments. Quite as much interest was shown in the various demonstrations and clinics as in the program.

Department of Physiology

Demonstration of some clinical blood and urine tests.

Veterinary Experiment Station

Demonstration of the technique for the examination of the semen of bulls.

Department of Pathology and Bacteriology

(1) Brain lesions in domestic animal.

(2) Demonstration of specific and non-specific intradermal reactions on guinea pigs.

(3) Pathological specimens of poultry diseases.

(4) Tuberculin reaction in poultry.

(5) Autopsies on poultry.

Surgical Clinic (Operating Room)

Surgical exercises on the cow. Operations given over to visitors.

Department of Medicine (Medical Building)

Physical examination of cattle.

Small Animal Clinic

(1) Dressing of cases.

(2) Demonstration of common parasites in dog and cat.

Farriery

Exhibit of special shoes for founder, navicular disease, side bones, and quarter cracks.

Veterinary Experiment Station

Inspection of new buildings at the Anti-Hog Cholera Serum Plant.

An informal dinner was held at the Ithaca Hotel, on Friday evening, Dr. P. A. Fish acting as toastmaster. The after-dinner speakers and their subjects were: Hon. C. P. Norgord, Assistant Commissioner of Agriculture, "The Plan of the Department of Farms and Markets for Controlling Tuberculosis"; Prof. G. F. Warren, of the Department of Agricultural Economics and Farm Management, College of Agriculture, "The Outlook for Agriculture"; Dr. R. W. Thatcher, Director of Experiment Station, Geneva, N. Y., "Needed Experimental Work"; Mr. C. P. Bigler, President of the N. Y. State Holstein-Friesian Association, Syracuse, N. Y., "The Relation of Veterinarians to the Live Stock Industry."

Commissioner Norgord explained in some detail what had been accomplished in diminishing bovine tuberculosis, and the plan of the Department to utilize the service of the practitioners as fully as possible in the future.

It was the hope of the college faculty that the new wing to the main college building might be used at this session, but unavoidable delay rendered this impossible. It is expected that the increased facilities and added conveniences will assist in making the next Conference even more successful.

P. A. F.

VIRGINIA STATE VETERINARY MEDICAL ASSOCIATION

The thirty-first annual meeting of the Virginia State Veterinary Medical Association convened at Murphy's Hotel, Richmond, Virginia, January 10-11, 1924.

The meeting was called to order by the President, Dr. E. J. Will, of Harrisonburg, who made a most timely address, the keynote of which was the stressing of the importance of loyalty in members of the Association, both to the organization and their fellow practitioners. Dr. Will has been a most loyal member of the Association for more than twenty years.

Next on the program was the report of the Secretary, Dr. Geo. C. Faville, of Hampton. This was followed by reports of the various committees.

Dr. B. H. Ransom, of the United States Bureau of Animal Industry, gave a most interesting and instructive address on "Ascariasis of Swine," illustrated by moving pictures. Dr.

Henry Marshall, of Richmond, rendered an excellent paper on "Post-Mortem Technique, with Special Reference to Tuberculosis," and exhibited fresh pathological specimens from tuberculous animals. This paper was most interesting and helpful, especially to those engaged in tuberculosis eradication or meat inspection.

Prof. F. S. Gammack, poultry specialist, of Hampton, read a paper entitled "The Relation of the Veterinarian to the Poultry Industry," which was most interesting. Mr. Gammack was followed by Dr. O. F. Foley, practitioner, of Bridgewater, who presented in a most practical manner the veterinarian's side of the question. His paper was discussed by a number of veterinarians present, showing that there is interest being shown and study given this phase of veterinary practice.

Dr. Wm. Moore, State Veterinarian of North Carolina, entertained the Association by giving some valuable and practical advice on legal matters which concern all veterinarians.

The Association was then honored by an address by Dr. C. H. Stange, Ames, Iowa, President of the American Veterinary Medical Association, who made a talk that will long be remembered by the Virginia Association, as it was very instructive and most interesting. Dr. Stange especially stressed the fact that we must pay more attention to veterinary education, and pointed out several instances which impressed his hearers with the fact that his suggestions were full of logic.

Dr. J. I. Handley, of Atlanta, Secretary of the Southeastern Veterinary Medical Association, was next introduced. He addressed the Association, outlining the area, aim and purpose of his Association. He further stated that the Southeastern Association would convene in Richmond, Virginia, in November, for a two-day session.

Major H. L. Freeland and Capt. H. M. Shoemaker, U. S. Army, outlined the details relative to veterinarians enlisting in the R. O. T. C. The members listened to these gentlemen with close attention and enthusiasm, and from the interest manifested we feel certain a number of Virginia veterinarians will put in their applications.

Later, reports of cases by different members and a general discussion of same, entered into by the entire Association, completed the business and professional program. Election of officers was next in order, and resulted as follows: Dr. E. A.

Robinson, of Petersburg, President; Dr. P. M. Graves, of Culpepper, 1st Vice-President; Dr. W. H. Ellett, of Richmond, 2nd Vice-President; Dr. H. T. Farmer, of Richmond, Secretary-Treasurer.

Following a motion, duly seconded and unanimously carried, a committee of three was appointed by the President to select ten names, members of the Association, to be sent to the Governor with the request that the first five be appointed members of the Examining Board. The President named on this committee Dr. J. G. Ferneyhough, Richmond, Chairman; Dr. John A. Turlington, Wachapreague; and Dr. Burnley W. White, North Emporia.

Dr. Ferneyhough then took the floor; and stated that, if no member of the Association objected, the Governor would be requested to reappoint the present board, consisting of Dr. S. C. Neff, Staunton, President; Dr. Thos. Fraser, Richmond, Secretary-Treasurer; Dr. H. S. Willis, Gordonsville; Dr. W. T. Gilchrist, Norfolk; and Dr. H. H. Adair, Bristol.

The legislative committee, consisting of Dr. J. G. Ferneyhough, Dr. Thos. Fraser and Dr. S. C. Neff, being reappointed by the President, the latter then announced the Board of Censors as follows: Dr. J. P. McDonough, Richmond; Dr. Henry Marshall, Richmond, Dr. R. E. Brookbank, Richmond; Dr. J. F. Kagey, South Boston; and Dr. S. C. Neff, Staunton.

No further business appearing, the Association adjourned, to meet at Ocean View Hotel, Ocean View, Virginia, July 10-11, 1924.

The members then escorted their guests to the dining-room, where more than a hundred covers were laid. The luncheon was given by the Association to its members and their guests. This custom was established some years ago, and is adhered to, each legislative year, at the mid-winter meeting, which is always held in Richmond. The guests of honor were Governor E. Lee Trinkle, Attorney-General John R. Saunders, Lieutenant-Governor J. E. West and many members of the House and Senate. Dr. Stange, of Iowa, Dr. Moore, of North Carolina and Dr. Handley, of Georgia, were the out-of-state veterinarians present. It is needless to add that after a sumptuous luncheon and numerous after-dinner speakers, presided over by our inimitable toastmaster, Dr. Ferneyhough, a delightful time was enjoyed by all.

H. T. FARMER, *Secretary.*

WASHINGTON STATE COLLEGE POST-GRADUATE SCHOOL FOR VETERINARIANS

The College of Veterinary Science of the State College of Washington, gave a post-graduate course for veterinarians of the Northwest, January 14-17, 1924. The states of Washington, Oregon, Idaho and Montana and the Province of British Columbia were well represented at this meeting, there being a total attendance of fifty-five veterinarians. Graduates from twelve of the veterinary colleges of the United States were among those present.

The program was carried out according to schedule, with Dr. Maurice C. Hall, of Washington, D. C., and Dr. T. H. Ferguson, of Lake Geneva, Wis., carrying the heaviest part of the load. These men were ably assisted by Dr. E. A. Ehmer, of Seattle, Dr. W. C. Johnson, of Puyallup, and Dr. J. G. Jervis, of Milner, B. C.

In addition to the veterinarians from outside of the State College, Dr. J. A. Howarth and Dr. J. E. McCoy, both of the State College, presented the subjects for discussion at this meeting. Professor E. V. Ellington, Professor John S. Carver and Experiment Station Chemist, J. L. St. John, also contributed to the three-day program. The results were very gratifying indeed. The men in attendance voted unanimously their appreciation of the post-graduate school and asked that the plan be continued and that similar programs be given here, if possible.

These short post-graduate courses are doing a great deal to create interest in the Northwest and are certainly appreciated by the practitioners of this region.

E. E. WEGNER, *Dean.*

IOWA VETERINARY ASSOCIATION

The thirty-sixth annual meeting of the Iowa Veterinary Association, which was held at Des Moines, January 15-16, 1924, was perhaps the largest meeting that the Association has ever held. In the course of the program, several matters of considerable interest to practitioners were presented, which probably accounted for the special interest, although the Iowa meetings have been growing in size each year.

In his presidential address, Dr. John Patterson stated that he believed that the veterinary profession was now going through a process of elimination, which would be beneficial. He made a

strong plea for both individual and united effort along every line of veterinary activities. Secretary Steel reported 471 members on the roll, and approximately \$500.00 in the treasury.

The following program was presented the first afternoon:

"Studies of Post-Vaccination Trouble Cases"—Dr. E. A. Cahill, Zionsville, Ind.

"Some Hog-Lot Diseases"—Dr. R. G. Moore, Dunlap, Iowa.

"Hog-House Sanitation"—Dr. H. J. Shore, Fort Dodge, Iowa.

"The Actual Cautery in the Treatment of Inflammations of Tendon and Periosteum"—Dr. John W. Adams, Philadelphia, Pa.

"Cesarian Section in Sows"—Dr. G. T. Smith, Reinbeck, Iowa.

"Some Observations on Farmer Vaccination of Swine"—Dr. B. H. Brooks, Riverton, Iowa.

"Membership in the American Veterinary Medical Association"—Dr. H. Preston Hoskins, Detroit, Mich.

The evening program consisted of the following:

"The Principles of Immunology"—Dr. Chas. Murray, Ames, Iowa.

"Some Phases of Veterinary Medicine" (Illustrated)—Dr. C. H. Stange, President, A. V. M. A.

Dr. Murray gave the tabulated results of the questionnaires which had been sent to Iowa practitioners, in an effort to get some reliable data on the actual use of biologic products and the results obtained with them. Tetanus antitoxin, rabies vaccine, blackleg aggressin and filtrate and hemorrhagic septicemia bacterin (bovine) appeared to be giving the best satisfaction, as far as the data would indicate.

Dr. Stange rendered a preliminary report for the Committee on Statistics, which is compiling figures on the extent of farmer vaccination, in Iowa, and the results.

The Wednesday morning program consisted of:

"The Handling of the Prolapsed Uterus"—Dr. Irving Moles, Central City, Ia.

"Tuberculosis Eradication"—Dr. J. A. Barger, Des Moines, Ia.

"The Cooperation of Practitioners in Tuberculosis Eradication in Iowa"—Dr. R. A. Moye, Manson, Iowa.

In the afternoon the following papers were presented:

"The Iowa Department of Agriculture"—Hon R. W. Cassidy, Secy. of Agri., Des Moines, Iowa.

"The Recent Outbreak of Anthrax in Iowa"—Dr. P. Malcom, Des Moines, Iowa.

"Sanitation and Its Relation to the Control of Anthrax"—Dr. L. E. Willey, Sioux City, Ia.

"Anthrax"—Dr. A. Eichhorn, Pearl River, N. Y.

"Poultry Practice"—Dr. C. E. Ackerman, St. Joseph, Mo.

"My Method of Developing a Poultry Practice"—Dr. P. L. Stow, Applington, Ia.

"Drug Elimination Through the Udder as Related to the Treatment of Mastitis"—Dr. H. D. Bergman, Ames, Ia.

A spirit of optimism prevailed among the Iowa veterinarians, although conditions due to the depression in agriculture have influenced veterinary practice in the state. Farmer vaccination,

while annoying, is not depriving the practitioners of their vaccination work except to a limited extent. The main complaint along this line at the meeting was that some of the permit-holders are vaccinating their neighbors' hogs. Some danger exists from this source, unless this practice is checked, although the law does not permit farmers to vaccinate any other than their own hogs.

As regards tuberculosis eradication in the state, the situation is very encouraging, for practically one-third of the counties have signed up to adopt the county-area plan, and by the end of the summer probably the majority of the counties will adopt this plan. Practitioners are to be used, along with State and Federal veterinarians, in this work, being employed on a per-diem basis. Just how that will develop is a matter that will take some time to determine.

The following officers were elected for the ensuing year: President, Dr. H. D. Bergman; First Vice-President, Dr. R. D. Wall; Second Vice-President, Dr. W. E. Macklin; Secretary-Treasurer, Dr. E. R. Steel; Member of Executive Committee, Dr. C. J. Scott.

E. R. STEEL, *Secretary.*

IOWA STATE COLLEGE CONFERENCE FOR VETERINARIANS

The ninth annual conference for veterinarians, held under the auspices of the Veterinary Division of the Iowa State College, was called to order at 9:30 a. m., January 17, 1924, with 170 veterinarians in attendance. These men were chiefly from Iowa, with a few representatives from surrounding states. The sessions were very well attended from the first to the last, and the interest seemed to be unusually good.

Dr. H. B. Raffensperger, of the Bureau of Animal Industry, Chicago, Ill., presented his work on the life cycle of the round worm in pigs. This was followed by a demonstration given by Dr. E. A. Benbrook, of the Department of Pathology, on the methods of identifying parasites and parasite eggs as they are recovered from the feces. After the demonstration, those in attendance were taken to the laboratories, where they went through the steps of identifying the various parasites.

President Pearson addressed the Conference at the opening of the afternoon session. The reaction to his talk was very good

and there were a great many very complimentary remarks made by the veterinarians present. (President Pearson's address will be published in full in the April JOURNAL.)

Following the address by President Pearson, Dr. John W. Adams, Professor of Veterinary Surgery, of the University of Pennsylvania, gave a very complete discussion on roaring in horses, which was followed by an operation on a large draft stallion. It may be interesting to those in attendance to know that the wound has made a complete healing and the animal was returned home on February 12.

"A Demonstration of the Anatomy of the Region of the Withers and a Discussion of the Problems Involved in Operating Fistula of the Withers" was made by Dr. H. S. Murphey, Professor of Veterinary Anatomy, Iowa State College. Dr. Murphey used a recently dissected specimen and this was followed by a similar demonstration by Dr. H. E. Bemis, Professor of Veterinary Surgery, Iowa State College, on animals which had been actual cases, but which had been embalmed, frozen and sectioned in such a way as to show the extent of the diseased process.

In the evening an explanation of the dynamometer car, an invention of Professor E. V. Collins, was given by Professor H. B. Davidson, Head of the Department of Agricultural Engineering. A discussion of the use of the car was given by Professor A. B. Caine, of the Department of Animal Husbandry. Following this, two teams were used in competitive pulling contests. Dr. F. H. Kelley, of Goldfield, then demonstrated how he had been able to train his riding horse, and explained how he had stimulated a great deal of interest in riding, in his home town.

On Friday morning, January 18, Dr. W. F. Guard gave a brief preliminary report on periodic ophthalmia, in which he outlined the project which is being followed in working on this disease. He demonstrated on a number of horses the method of examining the eyes for the purpose of detecting the various changes which result from attacks of the disease. The cooperation of veterinarians throughout the State is being asked in gathering information and in applying treatment, so that the number of cases on which accurate reports may be obtained may be more rapidly multiplied.

The paper by Dr. H. E. Bemis, entitled "Fundamentals Essential to a Proper Understanding of Sterility," particularly emphasized the need of a more thorough understanding of the anatomy and physiology of the genital tract and of the functions

of the various accessory organs, as well as the importance of feeding and management. This paper was supplemented by a demonstration, under the direction of Dr. H. S. Murphey and his assistants in the Department of Anatomy, which showed the relation of the changes taking place in the genital tract of the cow in various stages of the estrous cycle and during pregnancy.

In the small animal clinic Dr. C. H. Covault discussed and demonstrated the proper methods of handling small animals and administering treatment. He then discussed a number of actual cases, which represented our most frequent problems, such as internal and external parasites, canine distemper, its complications and unusual forms. Following this, he demonstrated his method of spaying. A number of anesthetized experiment animals were available for the use of those who wished to perform the operation.

After lunch Dr. Chas. Murray, of the Department of Veterinary Investigations, demonstrated the entire equipment necessary for making the agglutination test for the diagnosis of white diarrhea in chickens. He explained the test and discussed its possibilities and limitations, particularly with reference to those problems which the practitioner may meet in trying to conduct the test in his own locality.

The final lecture and demonstration was made by Dr. John W. Adams, in which he discussed "The Use of the Actual Cautery in the Treatment of Chronic Inflammations of Bones and Tendons." His discussion was followed by the use of the cautery in firing cases of bone spavin, ring-bone and chronic tendinitis.

During the Conference the laboratories were open for the use of anyone having special problems which he wished to investigate.

H. E. BEMIS.

MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION

The twenty-seventh annual meeting of the Minnesota State Veterinary Medical Association was held in St. Paul, Minn., January 16-17, 1924, with 150 members in attendance. President R. J. Coffeen, of Stillwater, Minn., presided.

The first session was taken up with routine business including committee reports. Under new business, the matter of raising the dues in order to provide for two meetings a year was discussed. It was voted to raise the dues to \$5.00 and to continue to have two meetings a year.

The election of officers resulted as follows: Dr. R. L. West, Waseca, President; Dr. B. L. Cook, Farmington, First Vice-President; Dr. D. I. Remington, Tracy, Second Vice-President; Dr. C. P. Fitch, St. Paul, Secretary-Treasurer.

Board of Trustees: Dr. C. A. Nelson, Brainerd; Dr. Harry Evenson, Sacred Heart; Dr. C. G. Jennings, Morris; President West and Secretary-Treasurer Fitch.

The first paper was by Dr. W. L. Boyd of University Farm, St. Paul, entitled "A Study of the Methods of Handling Retention of the Fetal Membranes." This paper gave the up-to-date procedures in this rather common condition and was illustrated by lantern slides.

Major Robert J. Foster, Veterinary Corps, United States Army, Fort Riley, Kansas, gave an excellent paper on "The Post-War Development of the Army Veterinary Service." This paper pointed out the developments which occurred in the Veterinary Corps of the United States Army preceding and following the passage of the act giving rank to the veterinarians in the army. The speaker stated that at the present time, the Veterinary Corps was in an excellent condition. He further stated that there were still many vacancies in the reserve corps and urged the men to apply. Several applicants were received. This paper was followed by a short talk by Captain H. W. Savage, of the Veterinary Corps, Fort Snelling, Minnesota, on "The Veterinary Officers Reserve Corps."

On the evening of the first day the Honorable Arthur E. Nelson, Mayor of St. Paul, gave a most admirable address of welcome. He pointed out the relationship that exists between the country and the city, and especially that one was dependent upon the other for its own welfare. This address was responded to by Dr. R. L. West, of Waseca.

The next paper was by Professor A. D. Hirshfelder, Professor of Pharmacology, University of Minnesota. His subject was "Circulatory Stimulants with Special Reference to Camphorated Oil." Professor Hirshfelder has been studying a number of the drugs which have been commonly used for circulatory stimulants. He showed blood-pressure tracings from a horse which had been injected with camphorated oil and also with strychnin. Very little if any effect was noted for these drugs which are commonly used as circulatory stimulants. Tracings, however, made on a horse which was injected intravenously with adrenalin, showed a very decided effect from this drug.

The next paper was by Dr. V. A. Moore, Dean, New York State Veterinary College, Cornell University, Ithaca, New York, who spoke on "Some Important Facts to be Carefully Considered in the Control of Tuberculosis." Dr. Moore stated that the present campaign for the eradication of this disease was proceeding satisfactorily, but that great care must be taken in respect to the follow-up-work, and if this was not carefully and conscientiously done, that a great deal of the preliminary efforts would be in vain.

On Thursday the first paper was by Dr. W. A. Billings, Extension Veterinarian, University Farm, St. Paul, who spoke on "The Work of the Extension Veterinarian." The problems and difficulties of this work were outlined to the practitioners, and their assistance was earnestly solicited in order to make the extension veterinary service a success. Dr. Billings stated that he had no idea of doing any practice, that his work was purely educational, and was done in cooperation with the local practitioners.

"The Physiology of the Fetus and New Born" was presented by Dr. E. A. Hewitt, University Farm, St. Paul.

President C. H. Stange and Secretary H. Preston Hoskins, of the American Veterinary Medical Association, were present and gave short talks.

"Some of the New Medical Preparations" was the subject of the paper by Dr. N. S. Mayo, of Chicago. In the afternoon Dr. A. Eichhorn, of Pearl River, New York, spoke on "The Control of Some of the Important Infectious Diseases of Animals."

Dr. C. A. Nelson, of Brainerd, gave a paper on the subject, "For the Good of the Profession." He pointed out that the private practitioner needed better and more efficient advertising in order to bring his work properly before the people.

The meeting ended with a short discussion on "Disease in Cattle Produced by Feeding Sweet Clover," by Dr. C. P. Fitch, University Farm, St. Paul.

C. P. FITCH, *Secretary-Treasurer.*

OKLAHOMA STATE VETERINARY MEDICAL ASSOCIATION

The Oklahoma State Veterinary Medical Association held its winter meeting at the Huckins Hotel, Oklahoma City, January 16-17, 1924. The meeting opened with a business session, with Dr. F. F. Meads presiding. A spirited discussion was immediately

entered into, which terminated in a closer cooperation in the ranks of the Association, with more harmony prevailing than heretofore. President Meads pointed out several serious problems confronting the profession today, and his keenly analytical mind suggested means by which these problems might be met.

A number of very excellent papers were read at the meeting, and the discussion of these showed the deep interest of the members in the subjects presented. A very enjoyable banquet was held at the hotel. Entertainment was furnished by a colored glee club, consisting of twenty-seven voices. Dr. Walter J. Crocker, of Ft. Worth, Texas, acted in the capacity of toastmaster, and very fittingly introduced a number of splendid after-dinner speakers, chief among whom was Dr. Bradford Knapp, President of the Oklahoma A. & M. College.

The Oklahoma veterinarians, as well as many of their neighbors, are looking forward to the coming summer meeting with much interest. This meeting will be held in Medicine Park, and it is the intention to have it extend throughout the entire week, with a short program each morning, the remainder of the time to be devoted to pleasure and recreation.

Facilities here make it a nice place to spend a week in the Wichita mountains, and the indications are that we will have a good attendance and a real home-gathering of veterinarians. It is hoped that the veterinarians of the Southwest will turn out in full and enjoy themselves for a week. There is no question but that they will feel well repaid for their trouble.

Officers elected for the coming year are: President, Dr. C. R. Walters, of Tulsa; Vice-President, Dr. R. W. Bowerman, of Hennessey; Secretary, Dr. T. O. Booth, of Oklahoma City; Treasurer, Dr. F. Y. S. Moore, of McAlester.

L. B. BARBER, *Secretary.*

MAHONING VALLEY VETERINARY CLUB

A combined meeting of the Jefferson County Medical Association and the Mahoning Valley Veterinary Club was held at Reynoldsville, Pa., on Jan. 17, 1924.

Dr. L. A. Klein, Dean of the Veterinary School of the University of Pennsylvania, addressed the meeting on the subject of, "The Relation of Bovine Tuberculosis to the Milk Supply." This combined meeting was the first of its kind in this section

and it helped enormously in getting acquainted with the members of our sister profession and in raising the standing of the veterinarians of the Mahoning Valley Veterinary Club.

C. M. CHRISTY, *Secretary*.

COLORADO VETERINARY MEDICAL ASSOCIATION

In point of interest the twenty-first annual meeting of the Colorado Veterinary Medical Association, held at Denver, January 23-24, was probably the most successful yet held by the organization. Much attention was given to the question of advertising the veterinary profession, papers being presented on this subject by Dr. A. N. Carroll and Mr. G. W. Lynn, the latter being Secretary of the Master Plumbers' Association of Denver. This part of the program was most discussed by the members present and seemed to create the greatest interest. It resulted in instructions to the Executive Committee to carry on a definite program of advertising during the following year.

Dr. Maurice C. Hall, of the Zoology Division of the United States Department of Agriculture, presented an excellent discourse on "Infant Mortality," in which he pointed out that the subject of infant mortality in animals is still at the stage represented by human infant mortality in 1870, at which time the subject was just beginning to be discussed. He pointed out that the losses in young animals were extreme and that the present blindness was not justified. Dr. Hall also gave some demonstrations and a discussion on anthelmintic medication for small animals.

Dr. Cecil Elder read a paper on the injection of cattle with *B. tuberculosis* (avian) and the results of subsequent tuberculin tests in which the detailed experiments carried on under his direction showed conclusively that cattle could be infected with the avian organism, following which they had reacted to certain of the tuberculin tests.

Paratyphoid dysentery in lambs was discussed in a talk by Dr. Floyd Cross, of the Section on Veterinary Pathology, Colorado Experiment Station. He detailed an outbreak of this disease in which some 30,000 lambs were involved with a loss of approximately 7%. *Bacillus paratyphosus* B. was isolated and subsequent work showed that the organism produced symptoms and lesions typical of the original disease. Experiments also showed that fasting lambs was the chief factor in predisposing to this

condition, healthy, well-fed lambs being susceptible only after the administration of excessive doses, whereas those fasted for 48 to 72 hours contracted the disease and died after the administration of small numbers of the organism.

Dr. M. J. Dunleavy read a paper in which he described the endurance races of 1922 and 1923, urging the great value that might be obtained from these races. He stated that they showed conclusively that the well-bred horse had much greater endurance than the mongrel. This was so marked that the rules did not now allow anything but pure-bred animals to compete.

"The Clinical Significance of Inflammation" was discussed by Drs. H. E. Kingman and James Farquharson, in which they upheld the principle that both inflammation and fever were basically desirable processes and indicated reaction on the part of the tissues.

Dr. Geo. H. Glover reported on the United States Live Stock Sanitary Association meeting in Chicago. Dr. L. L. Glynn read a paper on "What the Bureau of Animal Industry has done in the San Luis Valley," and Dr. W. E. Williams on "Influenza or Mixed Infection in Swine."

The report of the Committee on Policy of the American Veterinary Medical Association was approved by the Association.

The following new members were elected: Drs. Crawford J. Hayden, Herman R. Niehaus, Leonard R. Pratt, George W. Reuter, Benj. F. Davis, Edward G. Le Donne, Harry C. Evers.

The following officers were elected for the new year: President, Dr. A. N. Carroll; First Vice-President, Dr. W. G. Blake; Second Vice-President, Dr. H. P. Scott; Secretary-Treasurer, Dr. A. G. Fisk. Executive Committee: Dr. W. G. Blake, Dr. C. C. Stewart, and Dr. N. J. Miller.

I. E. NEWSOM, *Secretary*.

MICHIGAN AGRICULTURAL COLLEGE VETERINARY SHORT COURSE

The Veterinary Division of the Michigan Agricultural College conducted a very intensive and successful short course for veterinarians during the last week in January. It was an innovation in short courses for Michigan veterinarians in that it continued for a whole week with classes running on an hourly schedule the same as the regular classes in the Veterinary Division. Assisting in the project were the Detroit Department

of Health, the United States Bureau of Animal Industry, and the State Bureau of Animal Industry.

The attendance was approximately fifty. Of these, three were from without the state. One-third of the total number registered remained throughout the whole week. The majority of those attending were men who have been in active practice for several years. It is interesting to note also that the majority of those attending were veterinarians who belong to the Michigan State Veterinary Medical Association and who regularly attend its meetings as well as local association meetings. It is regrettable that the younger generation of practitioners and those who do not ordinarily attend association meetings did not avail themselves of the opportunity to become informed first-hand, of the latest developments in the profession.

No tuition was charged for the course. All those who desired to reduce expenses to the minimum had an opportunity to secure rooms in private homes in East Lansing, at a cost much less than prevailed in down-town hotels. Meals were moderate in price. Coming as it did at the time of the year when many of our Michigan roads were impassable, veterinary practice was at low ebb. Therefore, the expense of attending the short course was reduced to the point where the cost of transportation was about the most important thing standing between the practitioner at home and the short course at East Lansing.

The daily morning program consisted of one-hour lectures in milk inspection, meat inspection, poultry diseases and genital diseases of cattle. The afternoon sessions were given over to laboratory demonstrations and clinics in the same four subjects that were emphasized in the morning program.

In milk inspection such subjects were discussed as microscopic and plate counts, the hydrogen-ion score, the administration of milk control, care of milking machines and milk utensils, the part-time inspector and milk inspection ordinances. Professors L. H. Cooledge and G. L. A. Ruehle, members of the faculty of the Bacteriology Department of the Veterinary Division were assisted by Mr. C. H. Chilson, Director, Bureau of Food and Dairy, Detroit Department of Health; Mr. T. H. Broughton, Director, State Bureau of Dairying; and Mr. Howard Estes, Flint Department of Health.

Subjects pertaining to meat inspection were abattoir methods, meat inspection ordinances, the regional lymph-glands, infectious and parasitic diseases in relation to meat inspection. Dr. H. H.

Sparhawk, Chief Inspector, Detroit Department of Health and Drs. F. W. Chamberlain, W. H. Chandler, and R. A. Runnells, of the College, had charge of this work.

Poultry-house sanitation, bacillary white diarrhea, fowl cholera, fowl typhoid, tuberculosis, blackhead, coccidiosis, colds, chicken pox, and parasites were phases of poultry practice covered by Dr. H. J. Stafseth of the Bacteriology Department. He also demonstrated the agglutination test for bacillary white diarrhea, tuberculin testing of fowls, and held several autopsies on fowls.

Dr. E. T. Hallman, of the Pathology Department, Dr. F. W. Chamberlain of the Anatomy Department, and Mr. I. F. Huddleson, of the Bacteriological Department, conducted the program on Genital Diseases of Cattle, which consisted of illustrated lectures on the anatomy, physiology and pathology of the genital organs of cattle. Control methods and the serological tests for infectious abortion were given a prominent place on this program. Dr. E. T. Hallman, on two afternoons, had an excellent clinical program arranged. Each afternoon he presented five cows, some of which were to be examined for pregnancy and others for the cause of sterility. A large number of the visiting veterinarians availed themselves of the opportunity to examine these animals personally.

On Wednesday afternoon Drs. J. P. Hutton and E. K. Sales, of the Department of Surgery and Medicine, conducted a small animal clinic. On two occasions during the short course Dr. B. J. Killham, Chief Veterinarian of the State Bureau of Animal Industry, addressed the "student body"—once on the proper methods of making out tuberculin test charts and again on the relation of the practitioner to the state department.

In the evening of the first two days of the course, round-table discussions were held. At one of these Dr. H. M. Newton, United States Bureau of Animal Industry, in charge of hog cholera control work in Michigan, discussed swine diseases and vaccination legislation.

During the latter part of the course Dr. H. B. Raffensperger, parasitologist from the Chicago laboratory of the Bureau of Animal Industry, gave an excellent illustrated lecture on the ascaris and a lecture on miscellaneous parasites of domestic animals.

The only social events of the week were the banquet of the Capitol Veterinary Medical Association on Wednesday evening and a smoker held jointly with the county agents of Michigan on

Thursday night. Both were greatly enjoyed by practically every veterinarian registered for the short course. Dean Ward Giltner, of the Veterinary Division, presided at the latter. It is very gratifying to note the harmony that exists between the veterinarians and county agents in Michigan. It will be remembered that the county agents and veterinarians joined forces in this state last spring to defeat the "farmer-vaccination" bill.

R. A. RUNNELLS.

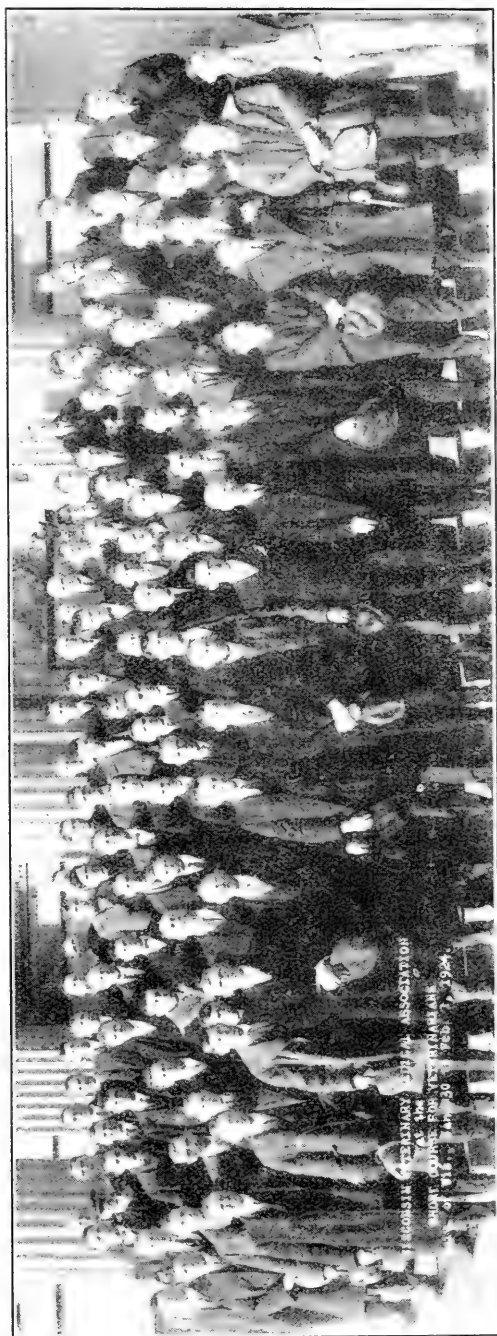
WISCONSIN SHORT COURSE FOR VETERINARIANS

The second annual Short Course for Veterinarians, held January 29 to February 1, inclusive, at the College of Agriculture, in Madison, proved to be a successful innovation in veterinary meetings, following the plan adopted last year of substituting practical laboratory exercises for the conventional type of program. The Short Course extended over three days and evenings, followed by a general clinic at Dr. West's hospital on the fourth day. According to those in charge there were exactly 143 veterinarians registered from 41 counties and three adjoining states. They represented 37.5 per cent of all licensed graduates in the state, so the attendance was excellent.

Upon arrival at Agricultural Hall we were met by Dr. F. B. Hadley, representing the University of Wisconsin, and Dr. O. H. Eliason, secretary of the Wisconsin Veterinary Medical Association, who registered and assigned us for the course. In order that each veterinarian might receive personal attention and instruction we were divided into two sections. Six different exercises had been planned and everyone had an opportunity to conduct all of them through assignment to the various laboratory sections.

THE LABORATORY EXERCISES

The laboratory work was under the supervision of members of the College staff, and included the following exercises: "Practice in Testing Serum for Bovine Abortion"; "Practice in Making Tests for Johne's Disease, Actinomycosis, and Equine and Avian Tuberculosis"; "Practice in Examining Feces for Parasites"; "Practice in Testing Milk for Fat." A feature of the hospital or clinical exercise was "Practice in Treating Dogs for Worms." Various anthelmintics were administered the first day. The following day the feces were examined, the dogs destroyed, and thorough autopsies held, followed by physical



Wisconsin Veterinary Medical Association at the Short Course for Veterinarians, University of Wisconsin, January 30 to February 1, 1924.

and microscopic examination of intestinal contents. Much real practical experience was gained in this work. The results were noted and recorded.

On the morning of the second day, R. S. Hulce, Associate Professor of Animal Husbandry, exhibited four lots of calves that had been reared on different types of rations. Detailed descriptions were given and by comparison of the animals exhibited the results of rations restricted in feed and water were clearly demonstrated. The most striking demonstration was that thrifty calves can be grown at reasonable cost on market milk without the addition of expensive feed supplements. The experiment to determine the effect of water on the appetites of young calves showed that no farmer who wishes to grow his calves rapidly and well can afford to neglect supplying them with plenty of water—the cheapest item in the feeding ration.

The culling of chickens was demonstrated by Prof. J. B. Hayes, of the Poultry Husbandry Department, in a most pleasing and instructive manner. He required each of us to try our skill at culling. Prof. Hayes holds that the head of the hen is a far better index to production than the body and legs.

THE LITERARY PROGRAM

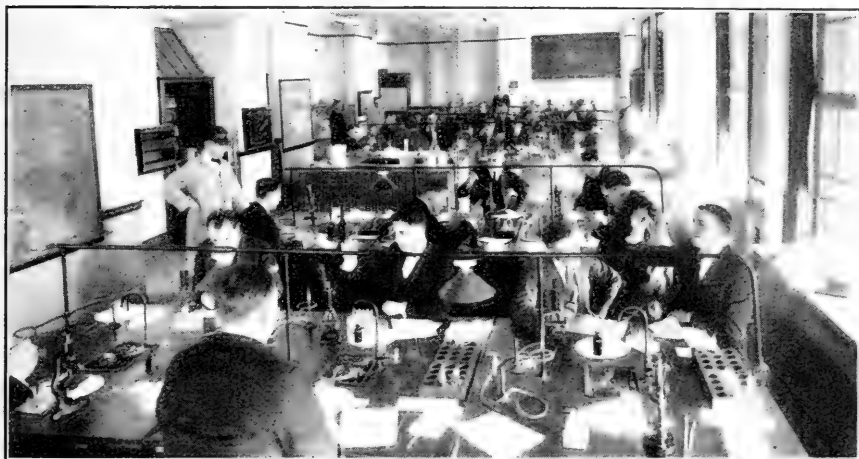
Dean H. L. Russell welcomed us to the University and urged our taking advantage of all it had to offer. He pointed out the interest which the University feels in the veterinary profession, the desire to assist it in every way possible, and his appreciation of its importance as vital to the success of the live stock industry of Wisconsin.

The literary program was most comprehensive in the variety of subjects considered. Since Wisconsin leads all other states in dairying, it quite naturally followed that the cow received much consideration. The eradication work on bovine tuberculosis was discussed at length. The outstanding contribution was the address of Hon. J. D. Jones, Jr., Commissioner of Agriculture. He presented the work of his department for the eradication of bovine tuberculosis in a clear, concise and forceful manner. In a most frank statement he described the difficulties encountered, as well as pointed out the success of the campaign.

With such ability and integrity as Commissioner Jones puts into the work, together with the able assistance of Dr. V. S. Larson, State Veterinarian, and Dr. J. S. Healy, Inspector-in-Charge for the Bureau of Animal Industry, the success of clean-

ing up the herds of Wisconsin is assured. The practitioners of Wisconsin are given a real part in the eradication work in that a fund is provided to pay indemnities for reactors to tests applied by them. This feature of the Wisconsin campaign is making possible the ultimate success in the badly infected districts of the southern counties. Dr. Larson outlined and discussed the regulations governing the work. Dr. Healy demonstrated the various tests and their interpretation at the clinic on Friday.

Dr. C. H. Stange, President of the American Veterinary Medical Association, was present on Tuesday evening and gave



WISCONSIN SHORT COURSE FOR VETERINARIANS

This section is at work in the bacteriological laboratory testing bovine blood serum to detect contagious abortion infection.

an illustrated address relative to the future of the profession. His talk was especially well received.

Dr. J. G. Hardenbergh, of the Mayo Foundation, at Rochester, Minn., and Dr. J. V. Lacroix, of Evanston, Ill., presented papers on canine diseases and treatment. Veterinary service as related to the meat packing industry was outlined by Mr. O. G. Mayer, of Chicago, Ill., while "Stable Ventilation Problems" were described by Mr. A. T. Logan, of Fort Atkinson, Wis. "Our Friends the Dumb Animals" was the subject of a most forceful plea for humane treatment of animals, both through entreaty and in pictures, by Dr. A. S. Alexander.

"Caricature in Human and Veterinary Medicine" took the audience back to the very beginnings of things medical. It was

an illustrated lecture by Dr. W. S. Miller, who enjoys the distinction of having attracted national attention for original research work in histology after he had reached the prescribed age limit of three-score years and ten. "Diseases of Animals in Relation to Public Health" was the subject discussed by Dr. W. D. Stovall. "Vasectomy as a Veterinary Operation" was presented by Dr. B. L. Warwick, and brought out some spirited discussion, led by Dr. H. D. Pattison of Beloit. Dr. J. T. Purcell, B. A. I. Inspector-in-Charge of hog cholera control work, outlined "Hog-lot Sanitation," describing the McLean County system, and urging its adoption. Motion pictures illustrating the "Physiology of Reproduction" and "Normal and Abnormal Childbirth" added variety to the program.

THE ANNUAL MEETING

The business session of the ninth annual meeting of the Wisconsin Veterinary Medical Association was held on Wednesday evening. It was presided over by Dr. G. H. Harland. The newly elected officers are Dr. W. R. Swan, Stevens Point, President; Dr. J. P. West, Madison, Vice-President. It was decided to accept the cordial invitation of Dr. A. F. Schrage to hold the semi-annual or summer meeting at Plymouth.

THE CLINIC

Dr. T. H. Ferguson had charge of the large animal clinic while Dr. B. L. Warwick operated on the small animals. Here our old friend the horse was given consideration, which unfortunately cannot be said of many recently held veterinary clinics.

J. S. KOEN, *Reporter.*

CAPITOL VETERINARY MEDICAL ASSOCIATION

The Capitol Veterinary Medical Association was reorganized at East Lansing, Mich., January 30, 1924. Officers were elected as follows: President, Dr. L. A. Wileden, Mason, Mich.; Vice-President, Dr. G. C. Moody, Mason, Mich.; and Secretary, Dr. A. E. Erickson, Charlotte, Mich.

Following the business session a conference was held, attended by representatives of the various local veterinary associations throughout the State. The purpose of this conference was to agree upon dates for meetings during 1924, so as to avoid conflicts as far as possible. The various associations were represented as follows:

Capitol Vet. Med. Asso., Dr. L. A. Wileden, President; Western Mich. Vet. Med. Asso., Dr. G. M. Thorndike, President; Southwestern Mich. Vet. Med. Asso., Dr. Geo. McCollister, Secretary; Central Mich. Vet. Med. Asso., Dr. C. C. Mix, President, and Dr. W. N. Armstrong, Secretary; Southeastern Mich. Vet. Med. Asso., Dr. H. Preston Hoskins, Secretary; Thumb Vet. Med. Asso., Dr. J. E. Wurm, President; Michigan-Ohio Vet. Med. Asso., Dr. A. J. Kline, President.

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS—MISSISSIPPI VALLEY DIVISION

The regular meeting of the Mississippi Valley Division of the National Association of B. A. I. Veterinarians was held at Dr. J. W. Joss' office, in the Federal Building, East St. Louis, Ill. on Feb. 2, 1924. President Dr. L. C. Stewart called the meeting to order.

Dr. Stewart read a paper and demonstrated two charts on "Post-Mortem Inspection," after which a discussion ensued, participated in by Drs. Timmerman, Maloney, Pease, Joss, Walls, and Stewart.

Following this the subject of "Abscesses in the Cervical Glands and Necks of Hogs" was discussed by Drs. Lambert, Blount, Stewart, Walls, Jenison, Pease, Joss and Timmerman. A few remarks were made on hog cholera by Drs. Surring and Stewart.

It was moved, seconded and carried that the discussion on abscesses be brought up again at the next meeting. A paper on "Tuberculosis and Actinomycosis" will be read at the next meeting, by Dr. M. L. Crans.

Drs. Timmerman and Garleb were appointed as a Committee to secure a suitable office for the holding of every other meeting in St. Louis, Mo. The following veterinarians were present at the meeting: Drs. S. L. Blount, G. H. Bruns, W. L. Cohenour, E. A. Garleb, T. T. Hartman, F. E. Hill, J. S. Jenison, J. W. Joss, R. C. Lambert, A. J. Maloney, J. F. Pease, W. M. Robertson, L. C. Stewart, R. E. Surring, F. S. Thurmon, H. J. Timmerman and A. C. Walls.

G. H. BRUNS. *Secretary.*

ALABAMA SHORT COURSE FOR GRADUATE VETERINARIANS

For the first time in the history of the college, a practitioner's course has been given, at the College of Veterinary Medicine, Auburn, Alabama, Feb. 4-9, 1924. The main or chief lines of work covered the diseases of dogs and cats, and the diseases of poultry. Quite a number of lectures and demonstrations were given on the diseases of cattle, mules, horses and swine.

Dr. J. C. Flynn, canine specialist, of Kansas City, Missouri, delivered two or three lectures each day for five days on the following diseases of dogs: Distemper, ear canker, intestinal parasites, cystitis, skin diseases, corneal ulcerations, poisons, black tongue, fright disease, rachitis, and rabies; and in cats: Contagious gastro-enteritis, distemper, ptomaine poisons, parasites, mange, and ring-worm.

Dr. Flynn gave the following surgical and clinical demonstrations: Spaying bitches and cats, treating a dog poisoned with strychnin, clinical examination of one with dumb rabies, one with furious dumb rabies, one with sarcoptic mange, one with prolapsus of the rectum, one with distemper, one with running fits, and one cat with mange.

Dr. B. F. Kaupp, poultry specialist, of Raleigh, North Carolina, gave the following lectures and demonstrations: Complete autopsy of the chicken, naming all parts, and commenting on the digestive processes; external and internal parasites of poultry; fowl typhoid, crop-bound, paralysis, botulism, tuberculosis, and roup. He also gave demonstrations on caponizing and giving anesthetics to poultry.

Dr. Peter F. Bahnsen, of Atlanta, Georgia, gave practical methods of restraining mules and horses with a rope, illustrating his methods of making halters, tying up front and hind limbs, casting, and the quick and usable way of making a hippo-lasso with a rope.

Dr. Elmer Lash, of Washington, D. C., by lecture and charts, reviewed the progress of tuberculosis eradication by the federal government and the various states.

Dr. R. S. Sugg, gave a practicum on taking samples of blood from cattle, hogs, and chickens, for the agglutination test. During the week he carried on complete tests for infectious abortion in cattle, and in hogs, and for the *Bacillus pullorum* in chickens.

Dr. N. G. Covington gave a complete post-mortem practicum on cow and horse cadavers. Dr. F. D. Patterson gave a very

interesting lecture on feeds and feeding of dogs. Dr. I. S. McAdory, with several fresh specimens, gave a very interesting lecture and demonstration on the generative apparatus of the cow.

Dr. C. A. Cary lectured and gave demonstrations, with animals and organs, on infectious abortion, cervicitis in cows, ovarian cysts, retained corpus luteum in cows, sterility, and udder diseases in cows. He also gave a clinical demonstration of the Iowa method of passing a stomach-tube in swine. By special request, he performed a roaring operation on a mule.

During the course, three moving pictures were run: "Clean Hearts and Herds," "Exit Ascaris," and Dr. Flynn's movie of "Furious Rabies in Dogs." After Dr. Flynn's lecture on rabies a rabid animal was brought before the audience and exhibited.

During the week, two dogs with dumb rabies and one dog halfway rabid, and with a paralyzed lower jaw, were exhibited at the clinics.

The Alabama Veterinary Medical Association held only a business session. The following officers were elected for the ensuing year: Dr. J. S. Cook, Union Springs, President; Dr. J. R. Sullivan, Montgomery, Vice-President; Dr. C. A. Cary, Auburn, Secretary-Treasurer.

On the night of February 8, the Students' Veterinary Medical Association gave a banquet, at which Dr. Peter F. Bahnsen made a most interesting talk on the subject of "How to Succeed as a Veterinarian." Success, he said, was obtained by hard work, steadfast and continued service.

There were 33 veterinarians in attendance at the short course and every man went away feeling that he had been repaid with knowledge and pleasure, declaring he would come back for a like course next year.

The new college buildings and equipment gave ample facilities for illustrating and handling all the work in the course. Some of the new things brought out were: First, Dr. Flynn's idea of fright disease being caused by some kind of poison in spoiled foods, a sort of forage-poison or botulism-like poison. Second, Dr. Flynn's method of spaying a cat and a bitch. Third, a treatment for sore mouth or black tongue that originated with Dr. L. K. Ogletree, of Enterprise, Alabama. This treatment is as follows:

Oleum terebinthinae	2 drams.
Cupri sulphas	2 drams.
Aqua dest., q.s.	8 ounces.

Mop out the mouth 3 or 4 times a day with this. Sometimes he uses the following, alternating its use with no. 1:

Potass. chloras	2 drams.
Tinct. ferri chlor.	2 drams.
Aqua dest., q. s.	8 ounces.

There were four veterinarians present who had been using this prescription for a year or more. One of them had treated as high as 50, another 60, with only 2 to 4% losses. One of the veterinarians claimed that he used prescription no. 1 exclusively, and got equally good results. Dr. Ogletree advised feeding the dog on fresh, raw, Hamburger steak; and he said that in the course of three to four days they will be eating and improving.

C. A. CARY.

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS ILLINOIS DIVISION

The regular monthly meeting of the Illinois Division of the National Association of Bureau of Animal Industry Veterinarians was held in the Government office of one of the local plants, at Chicago, February 4, 1924. There was an unusually large attendance and much interest shown in the work of the Association. Some of the subjects discussed follow:

Reclassification of the civil service employes, which will come up for consideration during this term of Congress. Ways and means for getting proper reclassification for the men in the field. The retirement bill was considered also, with a view to getting a more generous pension fund and lowering the age of optional retirement.

The next meeting will be held Feb. 19, 1924.

I. A. LUCAS, *Secretary*

KENTUCKY VETERINARY MEDICAL ASSOCIATION

The winter meeting of the Kentucky Veterinary Medical Association, held at Hopkinsville, Ky., February 6-7, 1924, proved as interesting and valuable as had been anticipated. The attendance was unusually good. The session opened Wednesday morning with a hearty welcome to the city of Hopkinsville by Hon. J. T. Wall. Dr. W. H. Simmons, State Veterinarian, responded.

Dr. H. Gieskemeyer, President, in his address thanked the Association for the honor they had bestowed upon him, in selecting him as their president, and outlined the progress made by the Association since its reorganization in 1912.

Then followed a paper by Dr. Wm. Coffee, of La Center, on "Malignant Edema," which was followed by a discussion by Dr. C. H. Ellis, of Barlow, and Dr. R. F. Fisher, of Paducah. Some very interesting points were brought out.

The afternoon session was opened by Prof. T. R. Bryant, of the University of Kentucky, who explained the purpose and accomplishments of agricultural extension work in Kentucky.

The important matter of "The Eradication of Bovine Tuberculosis in Kentucky" was discussed by Dr. W. H. Simmons and Dr. Wm. F. Biles. Among other things, Dr. Simmons stated that in 1920 the percentage of reactors in Kentucky was 2.5%; in 1921, 2.7%; in 1922, 2.4%; in 1923, 1.7%; showing a gradual decrease in the number of reactors.

At 6 p. m. a delightful banquet was served in the Rotary-Kiwanis room of the Hotel Latham. Dr. W. W. Dimock was toastmaster for the occasion.

The first paper on the program for the second day was read by Dr. R. F. Fisher, of Paducah, on "Infectious Mammitis in Cows." This paper was a very interesting one, and the discussion by Drs. W. W. Dimock, R. T. Jett and H. Gieskemeyer brought out some very interesting phases of the disease.

Dr. H. Gieskemeyer, a member of the Kentucky State Board of Veterinary Examiners, reviewed the progress and function of that board. Dr. W. W. Dimock gave a summary of the various problems confronted at the Experiment Station. He spoke of a disease now existing among pregnant ewes. He stated that quite a few ewes die of this disease. He further stated that he believed that they would soon become acquainted with all the factors of this disease. The hearing of the reports of the various committees closed the morning session.

The Kiwanis Club of Hopkinsville entertained the members of the Association at luncheon.

Dr. T. P. Polk, of the University of Kentucky, gave a very interesting talk and showed a motion picture on "Ascarids in Swine." Dr. R. T. Jett cited a very unusual outbreak of forage poisoning in his county. This paper was discussed by Dr. W. W. Dimock.

The following officers were elected for the year 1924: President,

Dr. W. W. Dimock, Lexington; First Vice-President, Dr. M. H. Dollor, Danville; Second Vice-President, Dr. J. R. Hill, Hopkinsville; Third Vice-President, Dr. F. Stevenson, Princeton; Secretary-Treasurer, Dr. J. A. Winkler, Newport.

While this meeting was not so largely attended as some other winter meetings held, keen interest in all papers was evident and the same goodfellowship predominated. Frankfort was selected for the summer meeting to be held July 9-10, 1924. The invitation to meet at Frankfort was extended by the B. A. I. force, through the Inspector-in-Charge, Dr. Wm. F. Biles.

J. A. WINKLER, *Secretary*.

KANSAS VETERINARY MEDICAL ASSOCIATION AND CONFERENCE OF KANSAS VETERINARIANS

The twentieth annual meeting of the Kansas Veterinary Medical Association was held jointly with the third annual conference at Manhattan, Kansas, in the veterinary buildings of the Kansas State Agricultural College, February 6-7-8, 1924. The program was of more than ordinary value and interest to the veterinary practitioner. The following were some of the outstanding contributions:

"The American Veterinary Medical Association," by its Secretary, Dr. H. Preston Hoskins.

"The Veterinary Practitioner's Place in the Agricultural Program" (Illustrated), by Dr. Robert Graham, University of Illinois. (To be published in the JOURNAL.)

"Conditions Affecting the Breeding Efficiency of Cattle" (Illustrated), and also a lecture and demonstration on "Sterility and the Physical Examination of the Genitals of Domesticated Animals," by Dr. W. L. Boyd, University of Minnesota.

"The Present Status of Abortion Disease in Cattle, Its Spread, Influence of Male and Control," by Dr. W. E. Cotton, Federal Experiment Station.

Other splendid papers and clinical numbers presenting special features, such as laboratory diagnosis, poultry diseases, etc., were given.

The following officers were elected for the coming year at a business session held at the close of the meeting: President, Dr. H. C. Gale, Clyde; Vice-President, Dr. C. A. Bliss, Osborne; Secretary-Treasurer, Dr. Chas. Bower, Topeka; Executive Board member, Dr. J. H. Burt, Manhattan.

Dr. R. R. Dykstra, Dean of the Division of Veterinary Medicine at the college, extended an invitation to the Association to meet again at Manhattan next year at the time of the Annual Conference of Kansas Veterinarians. This met with favor and the invitation was accepted unanimously.

I. J. PIERSON, *Secretary*.

VETERINARY ASSOCIATION OF MANITOBA

The thirty-fifth annual meeting of the Veterinary Association of Manitoba, since its inauguration by legislation, was held at the Manitoba Agricultural College, Winnipeg, February 7, 1924. There was a good attendance, there being about fifty members present.

The morning session commenced at 10 a. m., with an address from the President, Dr. J. R. Fisher, followed by the report of the Secretary-Treasurer and Registrar, and discussion of the affairs of the Association.

The Register showed 138 active members and nine honorary members, and the Registrar reported that all veterinary surgeons practicing the Province of Manitoba were registered. The financial statement, after paying all expenses for the year 1923, showed a balance of \$490 to the credit of the Association.

The election of officers for the year 1924, resulted as follows: President, Dr. A. Savage, Manitoba Agricultural College, Winnipeg; Vice-President, Dr. N. V. James, Gladstone; Secretary-Treasurer, Dr. Wm. Hilton, Winnipeg; Board of Examiners, Drs. A. Savage, J. B. Still of Winnipeg, and Dr. H. N. Thompson, of Virden; Council, Drs. Wm. Hilton, A. Savage, J. B. Still, of Winnipeg; J. A. Munn, of Carman; J. Fisher, Brandon; H. N. Thompson, Virden, N. V. James, Gladstone.

Mr. J. H. Evans, Deputy Minister of Agriculture for the Province of Manitoba, addressed the meeting at the luncheon which was held at the college.

During the afternoon session, practical demonstrations were given by Dr. A. L. Alton, Portage la Prairie; Dr. N. V. James, Gladstone; Dr. J. R. Fisher and Dr. H. H. Ross, Brandon; Dr. A. Savage, Dr. W. H. Hilton, Dr. T. G. Sprague and Dr. R. R. Ormiston, of Winnipeg.

The meeting was one of the most successful in the history of the Association.

J. B. STILL, *Secretary*.

ARMY VETERINARY SERVICE

REPORT OF THE SURGEON GENERAL

The report of the Surgeon General, for the fiscal year ending June 30, 1923, has been printed and distributed. Reference to it reveals that approximately thirty-one pages are devoted to matters concerning the Veterinary Corps. The statistics given in the report have been compiled from the sick and wounded records for the year 1922. The 1923 report shows a total of 10,229 horses and 4770 mules admitted to sick report for all causes, with a loss by death of 891 horses and 372 mules; the death rate per thousand admissions being 87.1 horses and 77.98 mules.

These figures are higher than those shown in the 1922 report, in which the reported death rate per thousand admissions was 59.85 horses and 61.19 mules. This increase in death rate has undoubtedly been the result of an insufficient veterinary personnel, lack of adequate hospital facilities at many stations, and the increasing average age of the animals, with the many ailments incident to senility. According to the Veterinary Bulletin for December 12, 1923, it is generally conceded that the lack of necessary funds for the replacement of public animals is causing considerable concern among all "horsed" units of the army.

On June 30, 1922, there were 158 veterinary officers in the Veterinary Corps of the regular army, and on June 30, 1923, there were but 125 officers, with one vacancy in the corps, although the National Defense Act, as amended, authorized a Veterinary Corps of 175 officers. It has been estimated that the 126 veterinary officers will be able to render sufficient service for an army having approximately 28,000 animals. As a matter of fact, the animal strength for 1922 averaged 51,768, which would indicate that the present Veterinary Corps should have almost twice its present strength, in order to render adequate veterinary service.

A number of communicable diseases made their appearance among the horses and mules during the year 1922. There were 117,021 animals tested for glanders, of which 32 were destroyed, as a result of positive intradermic mallein reactions or serological tests. There were nine cases of infectious anemia (swamp fever) destroyed in 1922, at Robinson Quartermaster Intermediate

Depot. There were reported during 1922 only 33 cases of influenza, resulting in the death of one animal. The incidence of strangles during the year was practically negligible, there being only 33 cases reported, with no deaths.

Epizootic lymphangitis occurred only in the Philippine Department, where 104 cases were reported. Ulcerative lymphangitis was reported in three animals, of which one died. Of 34 cases of tetanus, which occurred among army animals, eight died and five were destroyed. There were 13 cases of forage poisoning, diagnosed clinically, with 11 deaths. Piroplasmosis was reported in five horses and one mule from the Panama Canal Department. There were six suspected cases of mange, but in none of these were mange mites demonstrated. Pneumonia was responsible for the death of six horses and six mules during the year.

The report contains detailed records of the various diseases and conditions encountered, infectious and non-infectious, in both horses and mules, the admissions, disposition, either by death or return to duty, the severity of the cases, total days lost from duty and the average days lost for each admission.

The army veterinarians may well be proud of the showing they have made, in preserving the health and efficiency of the animals of the army, under conditions that are far from what they should be.

DR. HOLLINGWORTH PUTS UTICA ON THE MAP

Dr. W. G. Hollingworth, of Utica, N. Y., is Chief Veterinarian of the Department of Health of the City of Utica. The *Utica Observer-Despatch*, for Sunday, February 3, 1924, contained a feature article entitled, "How Uticans' Meat Market Supply is Guarded." About a half-page was devoted to the article, which was illustrated with photographs of Dr. Hugh H. Shaw, Health Officer, and Dr. Hollingworth and his staff of five assistants. On January 9, Dr. Hollingworth delivered the principal address before the Utica Kiwanis Club. His subject was "The Veterinarian's Duty to the Public Health." He reported that since 1922 it has been necessary to condemn a half million pounds of beef, pork and veal. Dr. Hollingworth also stated that many other cities, having heard of Utica's system, had sent officials to Utica to look over the work of the meat inspection bureau, with a view to adopting a system patterned after that of Utica. Splendid work, Dr. Hollingworth.

WOMEN'S AUXILIARY TO THE AMERICAN VETERINARY MEDICAL ASSOCIATION

With the coming of the New Year there are always new obligations to be met; some are very small, some large, but it is the combination of these small obligations that often does the most good.

We are starting a new fiscal year with the Women's Auxiliary, and, very soon, notices for dues will be sent out. Let us all respond promptly, in order that the good we are able to do may be increased.

The Auxiliary has helped a needy veterinarian and assisted three senior veterinary students to finish their education. Can we afford not to be one of those to help in this work?

The dues are \$1.00 a year, and there is an additional initiation fee of fifty cents for new members. These dues are used for three purposes: First, the expense of maintaining the Auxiliary, such as postage, stationery, etc. Second, an emergency fund, to give necessary assistance to the family of any veterinarian who has been temporarily or permanently disabled. Third, the loan fund, the rules of which were published in the February issue of the JOURNAL.

Last September, owing to the Secretary having been unable to attend the meeting, and the supplies being late in reaching Montreal, receipts were not issued for the dues received there. These receipts will be sent with those for the 1924 dues.

There are practically one hundred members of the Auxiliary. When we think of the many women who are eligible for membership, all of the wives, sisters, and mothers of members of the A. V. M. A., as compared with those who belong to the organization, it seems we have a mere handful. Will not each member try to get at least one new member before the next meeting?

You may fail to get your notice but will you not send your dues to the Secretary, anyway, in order to help a good cause?

(MRS.) R. P. MARSTETTER,

College Station, Texas.

Secretary.

HORSE BREEDING GROWS

Breeding of thoroughbred horses is increasing, according to statistics compiled by the Jockey Club. In 1923, 2,648 foals were registered, or 383 more than in 1922 and 908 more than in 1913.

MISCELLANEOUS

DR. TUCK VISITS EDINBURGH

President Stange appointed Dr. R. W. Tuck, of London, England, as the representative of the American Veterinary Medical Association to attend the 100th anniversary of the foundation of the Edinburgh Veterinary School, November 27-28, 1923. Dr. Tuck attended, and the following letter describes his visit.

"I left London on the evening of November 26th. A bitter wind was drifting the driving snow. Fog was everywhere, and I shuddered to think of what would be my fate in the morning, as I stood upon the station platform at King's Cross awaiting the Scottish Express. The fog caused the train to be a little late, and as the sleeper was crowded, the narrow passageway caused considerable difficulty in locating my berth, or, perhaps, I should say "room," as English sleepers are not double decked, such as we have in America, but consist of a small room with a single bed, collapsible washstand, etc. The bed stands crosswise of the room, so that the passenger rides crosswise of the train. I was aroused in the morning, at 6:30 a.m., by the conductor, and told to prepare for debarkation at Edinburgh, the train being on time. What was my surprise on stepping from the train to find a nice, warm, bright day and no appearance of snow or frost.

"Upon arriving at Edinburgh, I immediately proceeded to the North British Hotel and inquired for Mr. Bullock, the genial secretary of the Royal College of Veterinary Surgeons, who had called me by phone, in London, a few days previous and invited me to accompany some London veterinary celebrities who were to leave London by the morning train. Unfortunately I was unable to leave until night. Mr. Bullock took me in charge, and was of very great assistance in making my visit to Edinburgh one of pleasure.

"At the hotel I had the pleasure of meeting Lady and Sir John McFadyean, Sir Stewart Stockman, Professor Buxton of Cambridge, and a number of others. All seemed pleased that the American Veterinary Medical Association had sent a representative. In this connection I might state that only one other foreign country was personally represented—Denmark—by Professor Ellinger, of Copenhagen.

"The first exercises were held in the College, where Dr. O. Charnock Bradley held an "At Home," during which Sir John McFadyean presented to the college, in the name of Emeritus Professor Duncan McEachran, F. R. C. V. S., Quebec, Canada, a portrait of William Dick, the founder. This affair was carried out with considerable pomp, and the veterinary surgeons made a very fine showing, and gave one the impression that the veterinary profession in Scotland was on a very high plane. Sir John McFadyean said many very nice things about Professor Dick, and gave a graphic account of the early days of veterinary education.

"The second item on the program was at the University, in the anatomy classroom, with Principal Sir Alfred Ewing presiding. The main event was an address on "Comparative Pathology; Its Biological and Economical Significance," by Professor Theobald Smith, Director of Animal Pathology, Rockefeller Institute, Princeton, N. J. The chairman, when introducing Professor Smith, called attention to his research work, particularly in connection with human and bovine tuberculosis. The principal theme of Dr. Smith's address was man-made diseases, and particularly their biologic and economic importance. This meeting was well attended, and there was considerable applause.

"The third event in the evening was held at the city chambers, where the Lord Provost, Magistrates, and Council of the city held a reception. This affair was the *piece de resistance* of the celebration. The Lord Provost was attired in his scarlet velvet, trimmed with gold, as were his fellow officials. There were probably a dozen of these gorgeously attired officials, bedecked with official jewels and other insignia of their offices. Their red velvet, gold trimmings and ermine made a rich setting for the ladies, who were attired in the height of fashion and backed by the gentlemen, most of whom were in full dress. To enhance the scene, the building was handsomely decorated with flowers and plants and trimmed with many-colored flags. In fact, one was led to wonder whether he had not dropped into a reception given by some Bond street bankers instead of a veterinary celebration.

"At midday on Wednesday, a large gathering, consisting of veterinarians, students and the general public, met in the hall of the college, in Summerhall Square, and listened to an oration by Sir John McFadyean. The Duke of Athol, who presided, gave a brief address by way of introducing Sir John, who read a paper giving an account of the founding of the earliest veterinary colleges, those of Lyons and London, gave some instances showing the advantages of the veterinarian to the live stock owner, referred to the value of government aid to veterinary colleges, and to the object which William Dick set before himself, namely, to provide Scotland with veterinary surgeons educated up to the highest standard then possible.

"In the evening, Lord Forteviot presided at a reunion dinner held in the hall of the Royal College of Surgeons. Lord Provost Sleigh proposed the toast "Royal Veterinary College," and paid a splendid compliment to the valuable work rendered veterinary education by Professor Dick. Several other toasts were given, and all greatly enjoyed the sumptuous repast and then returned home to await the coming Bazaar."

(Signed) R. W. TUCK.

CLINICAL THERMOMETER CONFERENCE

A Clinical Thermometer Conference was held at the Bureau of Standards, January 30, 1924, to consider Senate Bill No. 1671, which has been introduced by Hon. Royal S. Copeland, Senator and former Health Commissioner of New York City. The bill calls for an inspection and test by the U. S. Bureau of Standards of all clinical thermometers offered for sale in this country. About fifty men were present, representing manufacturers, manufacturers, dealers, American Medical Association, Surgeons General of the Army, Navy, and Public Health, Hospital Association, American Veterinary Medical Association, and others.

Senator Copeland explained the reasons for supervision of clinical thermometers. His object in introducing the bill was to insure the greatest possible degree of accuracy and reliability. Judging from his experience as a physician he felt sure that there was great need for regulation, that Federal regulation would be much better than city or state, and that a testing system would be preferable to licensing.

These three questions were earnestly discussed by several representatives. It was the unanimous opinion of all present

that regulations are necessary and that the work of testing or licensing should be done by the U. S. Bureau of Standards. Also that the Federal law should be backed up by suitable state legislation where necessary.

There was a difference of opinion regarding the licensing versus the testing system. It was the unanimous opinion that perfect thermometers are not made. Of those submitted to the Bureau of Standards to be tested, about ten per cent are rejected. From a lot purchased in the open market at random, and submitted to test by the Bureau of Standards, forty per cent were rejected. When the manufacturer is equipped and licensed about five per cent of his thermometers would be rejected. Nobody at the Conference submitted a plan whereby the five per cent of bad thermometers would not find sale with the ninety-five per cent of those reliable, under the license system alone.

The question of licensing versus testing was put to a vote and nine voted for licensing and twenty-five for testing; five did not vote for the reason that they represented associations which had not considered the question or authorized their representatives to act; each of the three representatives from New York City, Massachusetts, and Connecticut, where the licensing system has been tried, voted for testing.

In the American Medical Association questions of legislation can be handled by the House of Delegates; the American Veterinary Medical Association has not authorized such action except when instructed to do so at a regular or special meeting. There can be no doubt of the necessity for the reliability of clinical thermometers used by veterinarians; those who are sufficiently interested should make their views known to members of Congress and do it soon. Resolutions from associations and letters from individuals would help in getting suitable laws and regulations on this subject.

C. J. MARSHALL.

A. V. M. A.

The name of Dr. F. Torrance should be added to the International Committee on the Control of Bovine Tuberculosis, as published in the February JOURNAL, p. 656.

Dr. O. E. Troy has found it impossible to act as Resident Secretary for New Mexico, and President Stange has appointed Dr. F. H. Barr, of Albuquerque, to the office.

NECROLOGY

GEORGE BYRON DUBOIS

Dr. Geo. B. DuBois died at Wilkes-Barre, Pa., December 3, 1923. He was born at Dimmick, Susquehanna County, Pa., on May 15, 1863. He attended the rural schools and prepared for college at the Keystone Academy at Factoryville, Pa. He taught school for a while and then entered the Ontario Veterinary College, from which he was graduated in 1887.

Starting in practice at Plymouth, Pa., Dr. DuBois moved to Wilkes-Barre the following year—1888, and resided there until his death. He was a charter member of the Wilkes-Barre Driving Club and served as vice-president of the Wilkes-Barre Riding and Driving Club. He owned several prominent racing horses at various times.

Dr. DuBois was a member of the Pennsylvania State Veterinary Medical Association. He is survived by his widow, one son and one brother.

GEORGE A. DALLIMORE

Dr. G. A. Dallimore died at his home in St. Paul, Minn., December 19, 1923, at the age of 77 years. He had been in active practice in St. Paul for a long time. At one time he was a member of the Minnesota legislature. He was a graduate of the Ontario Veterinary College, class of 1879, and was a former member of the Minnesota State Veterinary Medical Association.

GEORGE NOBLE KINNELL

Dr. George N. Kinnell died suddenly at his home in Pittsfield, Mass., January 15, 1924. He had been in poor health for about a year. He was 61 years of age.

Born in Dumfries, Scotland, the birthplace of Andrew Carnegie, he attended the Royal College of Veterinary Surgeons, in Edinburgh, and was graduated second in a very large class, in 1885. He practiced in South Wales for ten years. He located in Pittsfield about 35 years ago and built up a very lucrative practice.

Dr. Kinnell was the inventor of a non-slip, emergency horse-shoe. He perfected this shoe while in active practice and later showed it to some friends in Lenox, including Mrs. George Westinghouse, wife of the inventor of the air-brake. She recognized its merits and interested some New York capital in the

invention. Shortly afterwards numerous societies for the prevention of cruelty to animals recommended its adoption. The New York City fire and police departments adopted it, as did the black horse troop for presidential inaugurations in Washington. Patents were secured in the United States, Canada and abroad. Dr. Kinnell is said to have realized a very large sum from his invention, both before and at the time that all rights were sold to the American Chain Company.

Dr. Kinnell was at one time Inspector of Milk, Animals and Provisions, for Pittsfield. He was one of two citizens to introduce curling to Pittsfield. He was a charter member of the Saturday Evening Club, a literary and social organization. He wrote a great deal during the early years of his life and was regarded as a good judge of music and of dramatic productions and a discriminating critic.

In an editorial comment *The Berkshire County Eagle* paid him the following tribute:

So good a friend he was that children turned to him naturally as to a big elder brother, whose heart was warm as it was tender. He knew life—knew it on many sides. He was an educated man. In pursuing his studies and his reading he did not neglect the cultural phase. When any utterance that was characterized by nobility of expression came to his attention, he was quick to pass it on. He knew the lyric and the epic qualities that are in the background of our literature. Even his casual reports and letters were illumined by that originality of form that he knew so well how to command. The world knew him as a man skilful in his profession, as a man who did well everything he undertook, as an inventor, as a businessman. The circle of his intimates knew him as a raconteur of exceptional brilliancy, as a man of lambent wit, as a man who enjoyed the warmth and color of poetry and story and song—the varied strains of the best emotional life with its unconscious loveliness.

He is survived by two daughters and two sons.

CHARLES A. SCHAUFLE

Dr. Charles A. Schaufler died at his home, 1338 Hunting Park Avenue, Philadelphia, Pa., January 24, 1924. He had been sick for about a week, when he took a chill during the course of his work and in a few days developed acute nephritis, which resulted in death.

Dr. Schaufler was born in Atlantic City, N. J., April 1, 1860. He was educated in the public schools of that city and Chester Valley Academy, Downingtown, Pa., the German High School, Baden Baden, Germany, and received his veterinary degree from the Royal Veterinary College; Stuttgart, Germany, in 1881. For a number of years he was engaged in private practice in Philadelphia.

On June 19, 1893, Dr. Schaufler received an appointment to the Bureau of Animal Industry, since which time he had been continuously in charge of the Philadelphia station, a longer period than any other inspector-in-charge has ever enjoyed.

Dr. Schaufler joined the A. V. M. A. in 1884, and, at the time of his death, was one of the three remaining members who joined that year. He was also a member of the Pennsylvania State Veterinary Medical Association. He is survived by one son.

EDWIN P. HENDERSON

Dr. Edwin P. Henderson, of Houlton, Maine, died on January 26, 1924, his 53rd birthday. Death followed an attack of acute indigestion with heart involvement.

Dr. Henderson was born at Chelsea, Mass., January 26, 1871. He was a graduate of the New York College of Veterinary Surgeons, class of 1891. He also attended McGill University. He had been in the service of the B. A. I. for twenty-one years, and during the past twelve years held the position of U. S. Inspector-in-charge of the Northern Maine border.

Very active in Masonic circles, he was Master of Monument Lodge No. 86, Past High Priest, Royal Arch Chapter No. 20, Captain General, Commandery No. 17, St. Aldermar, etc. He was a member of and held office in the Rotary Club of Houlton. He joined the A. V. M. A. in 1916.

Dr. Henderson was held in the highest esteem by the people with whom he came in contact, including the leading citizens of Northern Maine. A man of magnetic personality, he was loved and honored by all who knew him.

He is survived by his widow, one daughter, his mother, and two sisters. Dr. Harry W. Jakeman, of Boston, Mass., is a first cousin of the deceased.

PERCY DUNPHY

Percy Dunphy, eldest son of the late Dr. George W. Dunphy, of East Lansing, Mich., and elder brother of Lt. Charles B. Dunphy, of Fort Benning, Ga., died at Eaton Rapids, Mich., January 29, 1924. Death was due to nephritis.

JOHN E. BLACKWELL

Dr. John E. Blackwell died at his home, in Pittsburg, Kansas, January 30, 1924, after an illness of six weeks. In December he suffered a slight cerebral hemorrhage. Nephritis was the cause of death.

Born in Barrie, Ontario, in 1865, he attended high school and was graduated from the Ontario Veterinary College, in 1887. He located in Omaha, Nebr., and established a practice there. He entered the service of the B. A. I. in April, 1893, and continued that connection until his death, having been stationed in Omaha, Nebr., St. Joseph, Mo., Hutchinson, Kan., and lastly at Pittsburg, Kan. Although not engaged in active practice he maintained a keen interest in current veterinary practice and was a lover of small animals.

Dr. Blackwell joined the A. V. M. A. in 1907. He was a Mason and a member of the Episcopal church. He leaves a widow, two brothers and two sisters.

JAMES DAVID NIGHBERT

Dr. J. D. Nighbert died at his residence in Pittsfield, Ill., January 31, 1924. He had been sick five weeks, but had been confined to his bed only three days. Death resulted from acute jaundice.

Dr. Nighbert was born near Palmyra, Macoupin County, Ill., October 20, 1856. He received his early education in the common school and in Blackburn University, at Carlinville, Ill. He received his veterinary education at the Ontario Veterinary College and was graduated in 1889. He located in Pittsfield immediately and remained there the rest of his life.

For a time Dr. Nighbert was a member of the Illinois State Board of Veterinary Medical Examiners. He joined the A. V. M. A. in 1899, and was a member of the Illinois State Veterinary Medical Association. He was a member of the A. F. & A. M. and of the Eastern Star.

Dr. Nighbert is survived by his widow, one daughter and one son, Dr. Maynard S. Nighbert, a veterinarian, and now serving his second term as mayor of Pittsfield, three brothers, one a veterinarian, Dr. E. M. Nighbert, of Queen City, Mo., and one sister.

In commenting upon his death *The Pike County Republican* paid him the following tribute:

Few men are as well known in Pike county as was Dr. Nighbert. None had a fairer reputation. Honest and unassuming, his life was one of fine service. He was universally trusted. Upon him the public bestowed unalloyed confidence. And in keeping with the high plane of his community life, his home life was ideal. He was one of the best of neighbors.

E. BLAINE HASKIN

Dr. E. B. Haskin, of Indianapolis, was instantly killed, with sixteen other passengers, in a collision of two cars of the Indiana Union Traction Company, two miles east of Fortville, Ind., February 2, 1924. He was 39 years of age.

At the time of his death, Dr. Haskin was B. A. I. Inspector-in-Charge of Tuberculosis Eradication in the State of Indiana. He was a graduate of the Cincinnati Veterinary College, class of 1910. He joined the A. V. M. A. in 1919. He was unmarried.

JAMES HART

Dr. James Hart came to a very untimely end at Jefferson City, Mo., February 3, 1924.

A native of Ireland and a graduate of the Royal College of Veterinary Surgeons, Glasgow, in 1884, he came to America and practiced in Nebraska, Iowa, and other states. During the late war he was employed by the British Government and was stationed at Lathrop, Mo. Later he became an employe of the Missouri State Penitentiary, in the capacity of guard.

On the night of February 3, he was attacked by three desperate convicts who had sawed their way out of their cell. He was struck a violent blow on the head, gagged, bound and cast into his shelter house, where he was found early on the morning of February 4. The convicts made their escape by scaling the stockade wall with the aid of a ladder. They were located, however, the evening of the 4th, in a straw-stack near Jefferson City, and made to pay for their crime with death, their bodies being literally riddled with buckshot from the guns of their pursuers, who showed them no quarter.

Dr. Hart joined the A. V. M. A. in 1917. He was a member, in good standing, of numerous Masonic orders. No near relatives are known in this country. He was 60 years of age.

BENJAMIN M. GOODMAN

Dr. B. M. Goodman died at Cincinnati, Ohio, February 4, 1924. His death was due to pulmonary complications following a long drawn-out struggle against diabetes.

Members of the A. V. M. A. will recall several reports in the JOURNAL from time to time, concerning Dr. Goodman, who was given financial assistance from our Relief Fund on two occasions. He was among the first to be treated with insulin, which only temporarily retarded the progress of the diabetic condition from which he suffered.

Born in Poland, January 28, 1887, Dr. Goodman received a high school education and later attended the Cincinnati Veterinary College, from which he was graduated in 1912. He practiced for a short time and the following year entered the service of the B. A. I. His first assignment was on meat inspection, at Chicago; later he was transferred to the Virus-Serum Control Division, and served at several stations. He resigned from the service in 1916, to enter the employ of the Eagle Company.

Dr. Goodman joined the A. V. M. A. in 1919. He was a member of the Indiana Veterinary Medical Association. He was a member of the Thorntown (Ind.) Lodge of Masons. He is survived by his widow, two sons, his father, his mother, two brothers and three sisters.

Dr. H. M. Renner, of Wellsville, Mo., died Dec. 16, 1923, following an operation for appendicitis. He was 40 years of age. He is survived by his widow.

Dr. N. M. Barnes, of Athens, Texas, died Dec. 21, 1923, following a stroke of apoplexy. He was 42 years of age. He is survived by his widow and four children.

Berlin has a cat-muzzling ordinance.

The death-rate in the United States, based on 85% of the population, is 11.8 per 1000.

MARRIAGES

Dr. Edward A. Wilson, of Hackettstown, N. J., to Miss Vivian Edson, of Benton, Pa., February 9, 1924.

Dr. Charles Clediss Beall, of Morgantown, W. Va., to Miss Cora Ellen Bailey, at Pittsburgh, Pa., Jan. 1, 1924.

BIRTHS

To Dr. and Mrs. M. Brodner, of Brooklyn, N. Y., a son, Seymour Wilson, Feb. 2, 1924.

To Dr. and Mrs. E. L. Harvey, of Geddes, So. Dak., a son, Donald Phillip, Jan. 24, 1924.

To Dr. and Mrs. R. W. Williams, of El Dorado, Ark., a daughter, Marian Anna, Jan. 2, 1924.

To Dr. and Mrs. Murray E. Patrick, of Greensburg, Pa., a son Murray E. Jr., Sept. 15, 1923.

PERSONAL

Dr. F. Gunster (San Fran. '15), formerly at Corvallis, is now at The Dalles, Ore.

Dr. L. D. Horner (U. P. '98) is the authorized Ford dealer for Woodstown, N. J.

Dr. B. A. Utter (McK. '16) has removed from Monterey, Minn., to Welcome, Minn.

Dr. E. M. DeTray (Ont. '07) was elected mayor of Napoleon, Ohio, at the recent election.

Dr. A. Paddon (Chi. '18) has removed from Mossbank, to Lucky Lake, Saskatchewan.

Dr. A. C. Stever (U. S. C. V. S. '07) is with the B. A. I., with headquarters at Meadville, Pa.

Dr. John J. Martin (U. S. C. V. S. '17) has removed from Newark, N. J. to Irvington, N. J.

Dr. C. J. Griffin (O. S. U. '13) has removed from Spencerville, Ohio, to Middletown, same state.

Dr. James A. Waugh (Ont. '82), of Pittsburgh, Pa., celebrated his 68th birthday on February 4, 1924.

Dr. J. H. McLeod (McGill '93) is now located at Maquoketa, Iowa, in the capacity of County Veterinarian.

Dr. E. J. McBride (Corn. '20), formerly of Warrensburg, N. Y., is now at 448 Ashland Ave., St. Paul, Minn.

Dr. George Smith, Jr., (O. S. U. '10) is Chief Food and Drug Inspector in the Division of Health, of Toledo, Ohio.

Dr. Harry T. Moss (Cinn. '05), of Dayton, Ohio, has been elected President of the Kiwanis Club, of Dayton, for 1924.

Dr. A. C. Curtiss, (Gr. Rap. '11), formerly of Wauseon, Ohio, is now assisting Dr. H. T. Carpenter, of Detroit, Mich.

Dr. E. T. Hallman (Ala. P. I. '10) has been serving as acting mayor of East Lansing, Mich., for the past six months.

Dr. Robert F. Fisher (Chi. '06) has been elected City Milk and Meat Inspector, by the City Council of Paducah, Ky.

Dr. C. A. Miller (K. C. V. C. '09), formerly of Sioux City, Iowa, is now stationed at San Diego, Calif., in the B. A. I. service.

Dr. C. C. Hunt (Ind. '10) has notified us of his change of address, from Lorain, Ohio, to 107 Washington Ave., Warren, Ohio.

Dr. W. E. Shumaker (Chi. '18), of Villa Ridge, Ill., is County Manager of the Pulaski County Live Stock Shipping Association.

Dr. C. D. Lash (K. C. V. C. '10) has been transferred from Chicago, Ill., to St. Louis, Mo., on meat inspection duty for the B. A. I.

Dr. H. A. Wilson (K. C. V. C. '13), has been reappointed State Veterinarian of Missouri, for four years, by the State Board of Agriculture.

Dr. G. J. Mutziger (K. C. V. C. '05) has been transferred from St. Joseph, Mo., to St. Louis, Mo., on meat inspection duty for the B. A. I.

Dr. J. M. Baxter (U. S. C. V. S. '16), formerly of Detroit, Mich., is now with the B. A. I., at Coatesville, Pa. Address: c/o Y. M. C. A.

Dr. H. J. Hearrington (St. Jos. '19) has been appointed Chief of the Department of Sanitation, Milk and Dairy Inspection, for the City of Okmulgee, Okla.

Dr. Charles H. Seagraves (San Fran. '18), formerly of Coeur d'Alene, Idaho, is now located at Astoria, Ore., in partnership with Dr. J. F. Rankin.

Dr. Cliff D. Carpenter (Corn. '20) has established the Petaluma Avian Pathology Laboratory, in connection with his poultry practice, at Petaluma, Calif.

Dr. E. G. Folsom (Ont. '08), of Detroit, Mich., recently underwent an operation for the removal of a renal calculus, and at last reports was doing nicely.

Dr. R. W. Tuck (Ont. '92) has been elected an honorary fellow of the Central Division of the National Veterinary Medical Association of Great Britain and Ireland.

Dr. B. F. C. McCoy (Ind. '07), of Columbus, Ind., has been in poor health for a number of months. He is expected to go to Texas shortly, for the benefit of his health.

Dr. Ward Giltner (Corn. '06), of East Lansing, Mich., addressed the Michigan Shorthorn Breeders' Association, on Feb. 7, 1924, on the subject of "Modern Views of Disease Control."

Dr. J. P. Hutton (O. S. U. '11), of East Lansing, Mich., addressed the Michigan Horse Breeders' Association, on Feb. 9, 1924, on the subject of "The Care of Horses' Feet."

Dr. A. H. Quin, Jr. (Chi. '20) formerly of Fort Dodge, Iowa, has been transferred to Sacramento, Calif., in the interests of the Fort Dodge Serum Co. He gives his address as Box 552.

Dr. Walter L. Martin (K. C. V. C. '11), formerly of Kansas City, Kans., has been detailed to the B. A. I. station at Pittsburg, Kans., made vacant by the death of Dr. John E. Blackwell.

Dr. J. C. McGrath (San Fran.), of Phoenix, Ariz., was recently appointed by the Supervisors of Maricopa County to assist the federal and state forces in the work of tuberculosis eradication in Arizona.

Dr. E. T. Hallman (Ala. P. I. '10), of East Lansing, Mich., addressed the Michigan Guernsey Cattle Club, on Feb. 5, 1924. His subject was "New Developments in Combating Contagious Diseases."

Dr. C. S. Parks (Ind. '21), of Albemarle, N. C., recently ordered a second A. V. M. A. automobile emblem, to replace his first one, which was stolen. He asks: "Can you imagine anyone stealing an emblem of this sort?"

Dr. H. E. Van Der Veen (Chi. '17) of Lake Geneva, Wis., is employed by the Borden's Farm Products Company of Illinois, as Veterinary Inspector. He was recently commissioned as First Lieutenant in the Veterinary Officer's Reserve Corps.

Dr. W. E. Frink (Corn. '07), writes from Hollywood, Calif., as follows: "I think the JOURNAL is getting better with each issue. The page of personals enables one far from his native land to keep in touch with the doings of friends and the articles on scientific matters seem to me well chosen."

Dr. Ernest F. Jardine (Ont. '11), of Basseterre, St. Kitts, rode his mount "Flashlight" to victory in the James Robertson Cup Race, at the Sandown race course, St. Kitts, January 10. Dr. Jardine's half-thoroughbred mare "Bonnie Bell" was a good third in the 6-furlong race for the Merchants Plate, the day before.

The younger daughter of Dr. and Mrs. W. H. Welch, of Lexington, Ill., recently met with a bad accident while bob-sledding. Her injuries consisted of a fractured rib and an injured kidney, the extent or character of which had not been determined at last reports, although her temperature and pulse had been normal for two days. We hope for her speedy recovery.

Dr. Don A. Boardman (Corn. '18), of Rome, N. Y., was the victim of a very serious automobile accident, on November 26, 1923. Dr. Boardman was driving to Itasca with a friend, in his Liberty Six. At the intersection of the Seneca Turnpike and Oriskany Falls Road, their machine was hit by a Ford touring car, and turned turtle. In the mix-up the car in which Dr. Boardman was riding was knocked so as to fall across his shoulders, breaking the second and third ribs on the left side and so injuring his shoulders that he could not lift a finger the next day. In addition, Dr. Boardman received a smashed finger, contusions on both sides of his head, one black eye, the other infiltrated with blood, and a puncture of the left lung. The latter injury caused him more trouble than any of the others. Dr. Boardman was kept straight on his back for four weeks without being able to lift his head from his pillow. He is still confined to his home and improving slowly.



O.R.F. LIBRARY DISCARD

SF American Veterinary
601 Medical Association
A5 Journal
v.64
cop.2
Biological
& Medical
Serials

1923-4

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

STORAGE

